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# ENTOMOLOGICAL NEWS

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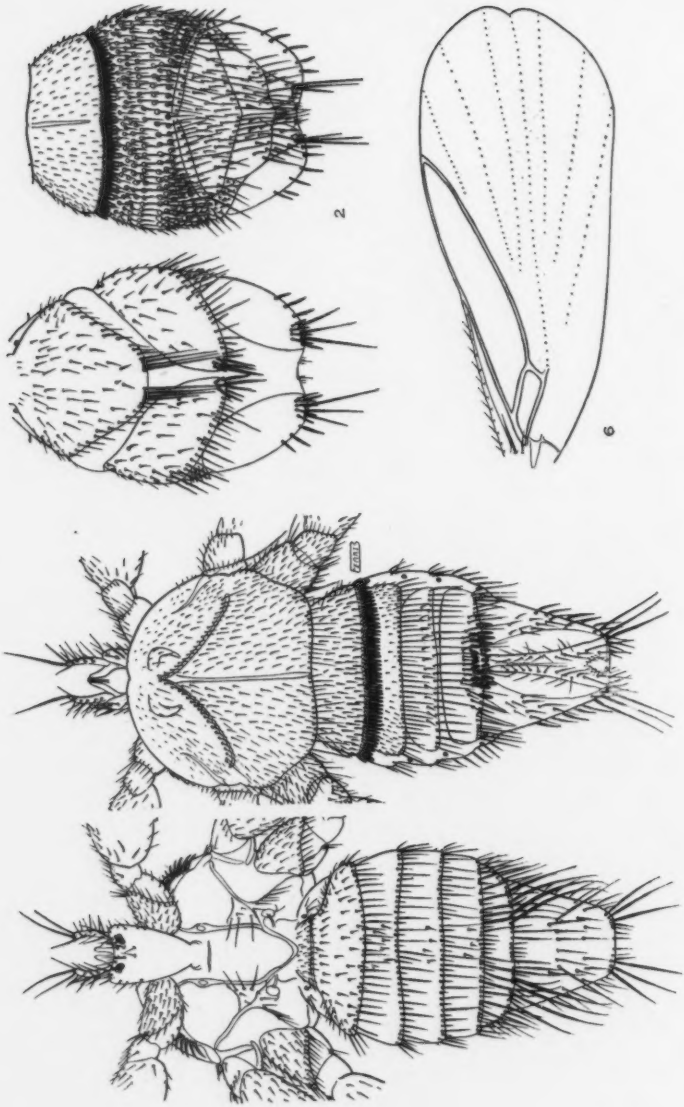

PENICILLIDIA ANTROZOI, 1, 2; NYCTEROPHILIA COXATA, 6.—FERRIS.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXVII. DECEMBER, 1916. NO. 10.


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## Some Ectoparasites of Bats (Dipt.)


By G. F. FERRIS, Stanford University, California.


(Plates XXII, XXIII.)

Those superlatively curious ectoparasites of bats, the Diptera of the families Nycteribiidae and Streblidae are among the least known of all the parasitic groups and but two species of Nycteribiidae and four of Streblidae have heretofore been recorded from North America. The Department of Entomology of Stanford University has accumulated a small amount of material belonging to both of these families and through the kindness of Professor Kellogg this has been turned over to me to work up. At the present time only part of the material can be reported upon, the remainder, belonging to the Streblid genus *Trichobius,* being withheld until a later paper.

The present paper presents the description of one new species and redescribes one species of Nycteribiidae and records and figures a third, and describes a new genus and species of Streblidae. The types of the new species are in the Stanford University collection.

NYCTERIBIIDAE.

**Penicillidia antrozoi** (Townsend). (Plate XXII, figs. 1, 2.)

*Nycteribia antrozoi* Townsend, Jour. New York Ent. Soc., Vol. I, p. 79 (1893).

*Penicillidia mexicana* (Bigot), Speiser, Zeitschrift für systematische Hymenopterologie und Dipterologie, Vol. II, p. 172 (1902).

Five specimens, two males and three females, from *Antrozous pallidus pacificus,* (Santa Paula, Ventura County, and Snelling, Merced County, California). The species was originally described from a single male taken from *Antrozous pallidus* in New Mexico.

Speiser is inclined to consider this species as identical with *Penicillidia mexicana* (Bigot), but, while this may be the case, such a conclusion is at present unwarranted. Speiser was able to examine the types of *P. mexicana* and redescribed the species but his redescription was not accompanied by figures and is not of such a nature as to throw much light upon the matter. For the present, at least, *P. antrozoi* should be allowed to stand.

♀. Length, 3 mm. *Head* rather slender with numerous short spines on the ventral side and along the anterior margin. Ocelli distinctly 2-facetted. Palpi rather long, with numerous stout spines.

*Thorax* somewhat broader than long. Legs of the type common to the genus.

*Abdomen* short oval, its shape varying with the degree of distention. On the dorsal side there are apparently three segments, but the exact number is difficult to determine due to the extent of the membranous areas. That this is the real number is indicated by the presence of but three pairs of spiracles. The first segment is very large, occupying nearly a third of the abdomen and is produced backward medially, the tip being broadly truncate. Following the first segment is a membranous area. The second tergite is divided medially into two plates and the third likewise into two plates which are widely separated. The first segment bears numerous short spines on its face and two clusters of long, stiff spines at the apex. Second segment likewise with numer-

ous short spines with a fringe of long spines along the posterior margin and a cluster of short heavy spines at the apex of each plate. Third segment with a cluster of stiff, heavy spines at the apex of each plate.

Ventrally there are apparently six sternites. The first occupies about a third of the abdomen and bears along its posterior margin the usual comb. Second segment membranous, beset with numerous short spines arranged in more or less regular rows, each spine set upon a chitinous papilla. Remaining sternites short and not extending across the abdomen, the lateral margins being filled by the pleurites of the apparent third dorsal segment, each of these sternites beset with numerous spines, the last having a cluster of stiff spines at each posterior lateral angle.

♂. Length, 3 mm. *Head* and *thorax* as in female.

Abdomen elongated, truncate at the tip. Dorsally there are seven segments each of which bears a pair of spiracles. First segment very short, indistinctly separated from the second. Second to sixth subequal in length. Seventh as long as any other three, about twice as wide across the anterior margin as across the posterior. Second to fourth segments with a row of slender spines along the posterior margin and a few short spines on the disk. Fifth and sixth segments with numerous very long stout spines along the posterior margin. Seventh with a number of stout spines on the disk and at the apex. Ventrally there are visible but five sternites, the first four subequal in length. First segment with numerous short spines on the disk and with the usual comb along the posterior margin. Second and third sternites with numerous short spines and with a row of slender spines along the posterior margin. Fourth with a row of slender spines along the posterior margin the median portion of which is occupied by a group of short and very heavy, almost tubercle-like, spines. Claspers on the last segment long and slender reaching to the anterior margin of the segment.

**Penicillidia corynorhini** n. sp. (Pl. XXIII, fig. 3.)

A single female, taken from *Corynorhinus townsendi* (White River, Tulare County, California) which, according to Miller, "List of North American Land Mammals in the United States National Museum, 1911," is probably *Corynorhinus macrotis pullescens*. The species is very distinct, differing from *P. antrozoi* in the remarkable backward prolongation of the first dorsal segment of the abdomen, in the short, broad head and in numerous minor details. A direct comparison with any of the European species is not possible, due to the insufficiency of the descriptions.

♀. Length, 2.3 mm. Color yellow. *Head* rather short and broad almost destitute of spines dorsally. Ocelli 1- or obscurely 2-facetted. Palpi short.

*Thorax* wider than long, not especially distinctive.

*Abdomen* dorsally with four apparent segments and with at least four pairs of spiracles. First segment produced backward medially, the apex rounded. Second composed of two medially separated plates which are produced back to the end of the abdomen. Third segment membranous. Fourth segment a small trapezoidal plate terminating the abdomen.

The chaetotaxy of the dorsal sides is as follows: First segment with a few short stout spines on the disk and with several long slender spines along the margin at the apex. Each plate of the second segment with numerous short spines on the disk and terminating in a cluster of exceedingly long stout spines. Third segment thickly beset with short spines, each arising from a papilla. Fourth segment with several stout spines along the posterior margin.

Ventrally there are apparently five segments. The first occupies about half the abdomen and bears the usual comb. Second membranous, thickly beset with short spines which are arranged in more or less definite rows, the base of each surrounded by a small chitinous area. Third divided medially into two plates. Fourth and fifth undivided, each with a row of small spines along the posterior margin.

**Cyclopodia similis** Speiser. (Plate XXIII, fig. 4.)

*Cyclopodia similis* Speiser, Archiv. für Naturgeschichte, LXVII Bd. 1, h. 1, pp. 51-52, tf. 2c., Taf. 3, f. 5 (1901).

A single male from an unknown bat (Apia, Samoa), which I refer to this species. There are certain minor details in which the specimen seems to differ from Speiser's description but they seem hardly important enough to justify the naming of a new species. The opportunity is taken to present figures.

STREBLIDAE.

**NYCTEROPHILIA** n. gen.

Streblidae of the subfamily Nycteroboscinae, with functional wings in which there are apparently nine longitudinal veins in addition to the costa, of these veins only the first two and a portion of the third being strongly developed, the others very weak. Tip of the wing notched. Thorax much compressed, high convex. Legs short, the posterior femora scarcely reaching beyond the end of the body, the anterior femora very short,

compressed. Abdomen with but three dorsal segments, the first two very short, and with six or seven ventral segments.

Type of genus *Nycterophilia coxata* n. sp.

The wing venation of this genus differs very much from that of any of the other Streblidae. The genus seems to be nearest to *Megistopoda,* but the functional wings, the short posterior femora and the much expanded anterior femora separate it at once.

**Nycterophilia coxata** n. sp. (Plate XXII, fig. 6 and text-fig. 5.)

Several males and females from a bat, *Macrotus californicus* (Santa Margherita River, Calif.).

♀. Length, 1.8 mm.; length of wing, 1.3 mm. Color yellow. *Head* rather small, apparently attached to the upper side of the prothorax. Apex with a crown of stout spines, occiput and cheeks with a few small spines. Eyes quite large, distinctly pigmented, situated close to the apex of the head and consisting of a single facet.

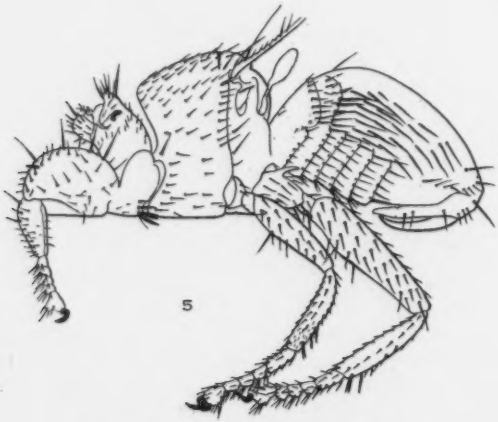
*Prothorax* very small, ventrally with a row of stout spines along the posterior margin. Mesothorax and metathorax high convex, much compressed, the mesothorax, in profile, slightly concave anteriorly. Both segments rather sparsely beset with small spines.

*Anterior legs* short, the femora much compressed and expanded dorsoventrally, the dorsal margin with numerous stout spines, the inner face with several short, stout, almost tubercle-like spines. Tibia slightly shorter than the femur. Tarsus equal to tibia, five segmented, the last segment somewhat expanded, the claws not cleft.

*Middle and posterior legs* in general similar to each other, slender, the middle pair somewhat the shorter. Posterior femora scarcely or not at all exceeding the abdomen. Coxae of middle pair very small. Coxae of posterior pair quite large and bearing a spur on the dorsal margin, this spur arising at the proximal end.

*Wings* large, apparently functional. First and second longitudinal veins distinct, the second meeting the anterior margin of the wing slightly beyond half way. A third longitudinal vein is distinct for a very short distance from the base and is connected to the second vein by a distinct cross vein, thence continuing much reduced to the tip of the wing, meeting the margin at the base of a distinct notch. The wing is apparently folded along this vein when at rest. Between the second and third veins are three interrupted veins, apparently branches of the second, and behind the third vein are three more which are apparently branches of the third. There are thus in all, nine longitudinal veins, exclusive of the costa, and one cross vein.

*Abdomen* soft, presenting two segments dorsally, the first segment very short. Ventrally there appear to be at least three segments but they are very indistinctly marked. The entire abdomen is beset with large spines with spiral markings.




*Nyeterophila coxata* n. sp. male, wings not shown.

♂. Similar to female except for abdomen. The first two tergites are weakly chitinized and bear a row of short spines along the posterior margin. The remainder of the dorsum is membranous and the median portion is entirely free from spines. Laterally, however, it is beset with long stiff spines. There are apparently seven sternites, the first six distinctly chitinized and with a row of spines along the posterior margin. The seventh sternite occupies about a third of the length of the abdomen. The male claspers are three in number and are appressed to the ventral side of the abdomen.

EXPLANATION OF PLATES.

Plate XXII.

Fig. 1. *Penicillidia antrozoi* (Townsend): dorsal and ventral views of male.

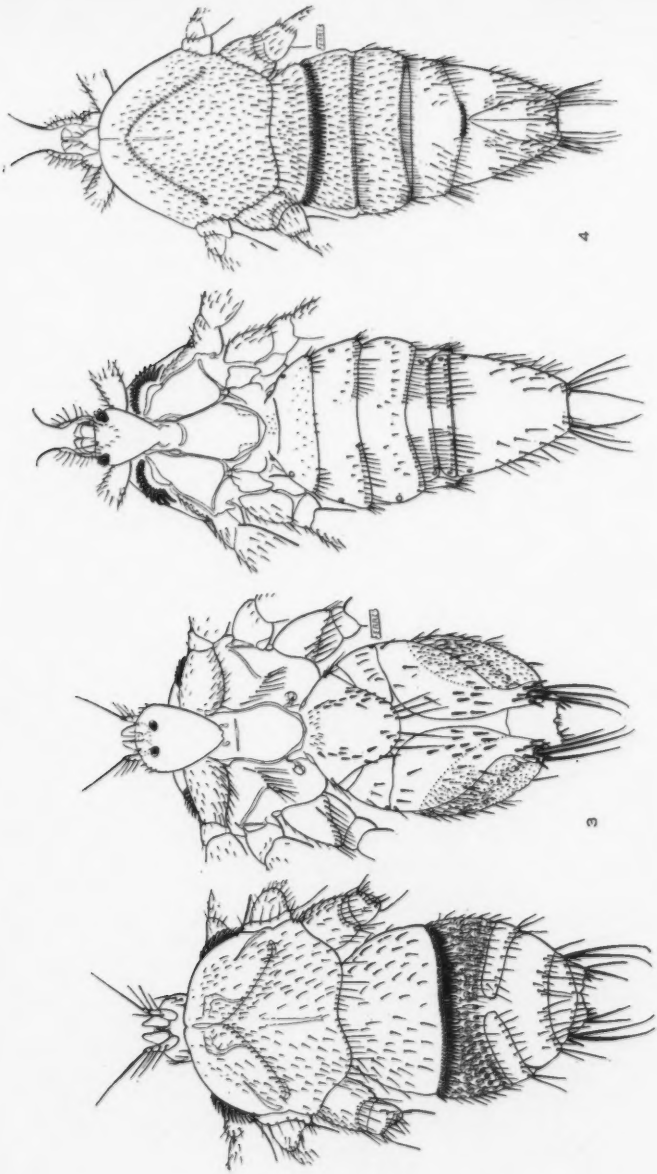
Fig. 2. *Penicillidia antrozoi* (Townsend): dorsal and ventral views of abdomen of female.

Fig. 6. *Nycterophilia coxata* n. sp.: wing.

Plate XXIII.

Fig. 3. *Penicillidia corynorhini* n. sp.: ventral and dorsal views of female.

Fig. 4. *Cyclopodia similis* Speiser: dorsal and ventral views of male.



PENICILLIDIA CORYNORHINI, 3; CYCLOPODIA SIMILIS, 4.—FERRIS.

# Dipterological Notes. II.

## A Study of the Lateralis-Group of the Bombyliid Genus Villa (Anthrax of Authors, in Part).

By E. T. Cresson, Jr., Academy of Natural Sciences, Philadelphia, Pa.

In working over the collection at the Academy of Natural Sciences of Philadelphia, this group of the Bombyliidae gave me some trouble. It includes Say's species *Anthrax lateralis* and *alternata*, and the original descriptions of these are so nearly alike in specific value that it is difficult to associate specimens with them satisfactorily. The next author to attempt to describe the two species as distinct is Coquillett,* and his attempt also does not seem to work out very well.

Before me is a series of specimens evidently belonging to this group, and to me it certainly contains two distinct species. Now as to which is *lateralis* and which is *alternata* is difficult to determine from Say's descriptions, with the possible exception of the sizes given. However, the two species in this series are easily separated by a character which has apparently been overlooked, or at least does not seem to have been mentioned, to my knowledge, in any descripiton of *lateralis* or *alternata*. That is the form of the vestiture of the lateral margins of the last four abdominal segments. In my series I can recognize two, with a doubtful third, distinct species from North America, belonging to this group, but there seems to be a number of possible varieties.

This group may be characterized as follows:

### *lateralis*-group.

*Third antennal joint onion-shaped with styliform apex. Face convex, epistoma not produced conically. Abdomen with black tomentum on dorsum; lateral pile of first and second segments pale; of third black. Fore tarsal claws minute.*

The name *Villa* Lioy (1864), genotype *Anthrax abbadon* Fab. is congeneric with *Hemipenthes* Loew (1869), genotype *Musca morio* Linn.

**Villa lateralis.**

1823. *Anthrax lateralis* Say, Journ. Acad. Nat. Sci. Phila., iii, 42.
1887. *Hyalanthrax lateralis* Osten Sacken, Biol. Cent. Amer., i, 135.

*1887. Trans. Am. Ent. Soc., xiv, 166.

Say's original description is given here:

"Black; wings hyaline; sides with fulvous hair; tergum banded. Inhabits Pennsylvania and Maryland.

Hypostoma and occipital orbits with white hair; stethidium with fulvous hair, particularly on the sides of the thorax, on the pleura and collar; wings as far as the basal transverse nervure fuscous, costal nervures fuscous, the included areola yellowish-brown; feet, the hair with a whitish reflection; tergum with a band of prostrate yellowish hair at the base of each segment, and with long fulvous hair each side as far as the middle of the length. Length nearly one-fourth of an inch. It belongs to Wiedemann's fifth tribe."

This species I have based upon the presence of the long scales on the lateral margins of the abdominal segments three to seven. There may be much variation in some of the other characters. I associate Say's name with this form on account of the smaller average size, the presence of "yellow prostrate hair on the bases of each segment.....the long fulvous hair on each side as far as middle of the length" of the abdomen.

The species may be described as follows:

*Description.*—Black, halteres yellow. Pile black on frons, face in part, first antennal joint, mesonotum, dorsum of scutellum and abdomen, and apical ventral segments; white on: face, pleura in part, pectus and basal ventral segments; golden yellow on: anterior and lateral mesonotal margins, prothorax, notopleura, meso- and meta-pleura, and lateral margins of abdominal segments 1 to 2. Tomentum black on: base of scutellum, apices of abdominal segments 1 to 8, bases of 5 to 7, and antecostal cell; white on: face, occiput, pectus, venter and legs; golden-yellow on: frons, lateral and posterior mesonotal margins, scutellar margin, lateral margins of abdominal segments 1 to 2, bases of 2 to 4, subapical bands of 5 to 7; bronze, sparsely, on disc of mesonotum and scutellum. Lateral margins of abdominal segments 3 to 7 with long cuneate scales intermixed with pile; those of 3, 5 and 6 are black, of 4 and 7 are white. Seventh of male with silvery scales.

Wings hyaline with humeral, subcostal, sometimes costal and first basal cells infuscate.

Bristles of mesonotum yellow, of scutellum and legs black. Hind legs not ciliate with scales.

Head hemispherical. Frons about twice as broad at antennae as at vertex. Face convex or epistoma slightly prominent. Post-orbital emargination distinct. Proboscis not protruding. First and second antennal joints subequal; third with styliform apex as long as remainder

of antennae. Scutellum apically pointed. Fore legs slender; their tibiae without extensor bristles or setulae. Middle and hind legs with distinct bristles and claws well developed. All pulvilli wanting or minute. Length 7.0 to 12.0 mm.

*Variations.*—Coquillett, in his paper previously mentioned, considers *lateralis* a variety of *alternata*, but later relegated it again to specific rank. It however has priority over *alternata*.

The amount of variation I cannot attempt to suggest with the small series before me, but even this shows some worthy of note.

The color of the pile and tomentum will vary from white to dark golden yellow. The yellow tomentum on the segments 3, 5, 6 may sometimes be absent, but it is always present on 2 and 4 and on 5 to 7; it may be apical, and apparently basal, depending on the amount of extension of the segments. The ground color of the basal angles of segments 1 to 2 is sometimes pale. In a few specimens the pile of the face, part of the pleura and more or less of the venter is black. In the males the lateral marginal scales of segments 4 to 7 are mostly black, but not in all cases.

variety **fulvipes.**

1887. *Anthrax fulvipes* Coquillett. Trans. Amer. Ent. Soc., xiv, 166 [Arizona].

This seems to be a good variety. The femora are, at least basally and sometimes entirely, pale.

variety **compressor.**

1887. *Anthrax compressor* Coquillett, Trans. Amer. Ent. Soc., 165 [California].

I do not consider this a distinct species. It seems to be based on the tomentum of segments 2-4 being lighter in color than that on segments 5-6,

variety **perimele.**

1830. *Anthrax perimele* Wiedemann, Aus. Zweifl. Ins., i, 583.

I have not seen this form to know it. Coquillett* records it from California. He characterizes it as having the tomentose

*1887. Trans. Am. Ent. Soc., xiv, 166.

bands on segments 3 and 5 yellow in contrast with the white on the others.

variety **nigra** new var.

Tomentum of abdominal dorsum, venter and patch on pleura entirely black or with narrow basal band on segment 4. Lateral scales of segments 3-6 entirely black or a few white on 4. The usual silvery scales on 7 present.

*Holotype.*— ♂, Beaverkill, Sullivan County, New York, August 10, 1909, (E. T. Cresson, Jr.), [A. N. S. P. No. 6106].

*Paratypes.*—2 ♂, topotypic.

I have seen only males of this form. The females probably are not to be differentiated from those of the typical form.

**Villa alternata.**

1823. *Anthrax alternata* Say, Jour. Acad. Nat. Sci. Phila., iii, 45.

Say's original description is given here:

"Body villous, above, beneath and sides cinereous; tergum fasciate with cinereous. Inhabits the United States.

Head black; eyes chestnut; front beneath the antennae bright cinereous; proboscis concealed in a groove to the tip; palpi distinct, exterior; thorax cinereous, tinged with fulvous each side, and at the scutellar suture; wings dusky, pellucid, nervures blackish-brown; base of the first transverse nervure brown opaque; pectus cinereous; feet blackish; scutel edged with cinereous; abdomen each side with dense long hair, which is cinereous on the first and second segments, but on the remaining segments alternating with black; tergum with six or seven cinereous lineolar bands; venter cinereous; segments particularly the third black at base. Length of body more than eleven-twentieths of an inch. Found in Pennsylvania, and also in Missouri. It belongs to Wiedemann's fifth tribe."

This species as I consider it differs from my conception of *lateralis* mainly in that the lateral margins of all abdominal segments are furnished with long pile, not intermixed with long scales on segments 3-7. Besides this the species is noticeably more robust in its build, the abdomen being distinctly broader than the thorax. The color of the pale pile is generally white, that of the lateral abdominal margins of segments 1-2 being long and especially conspicuous in contrast with the black on the others.

*Description.*—Black, halteres yellow. Pile black on: frons, part of face, disc of mesonotum, apices of segments 3 to 7, lateral margins of 3, 5, 6, apical segments of venter and legs; yellow or whitish on: part of face, mesonotal margins, pleura, pectus, segments 1 to 2, bases of 3 to 7, lateral margins of 4, 7, and basal segments of venter. Tomentum black on: mesonotum partly, base of scutellum, apices of segments 1 to 4, bases of 5 to 7, antecostal cell of wing partly; pale on: lower part of frons, face, occiput, mesonotum partly, scutellum except base, bases of segments 2 to 4, apices of 5 to 7, antecostal cell partly and legs.

Wings hyaline with extreme base infuscate, sometimes extending into the basal cells.

Structurally similar to *lateralis,* but the fore tibiae with extensor bristles or setulae. It is more robust with the abdomen noticeably broader than the thorax. Length 12-16 mm.

The above description is drawn from a female collected at Lloydminster, Saskatchewan, Canada, July 31.

A male, Aweme, Manitoba, Canada, Sept. 1, 1903 (N. Criddle), and two males, Fort Wingate, New Mexico, I also place here. They have the following characters:

Vertex broad as antennae; frons and face black pilose and tomentose; some black pile on pleura; mesonotum black tomentose and scutellum entirely so. No conspicuous band of pale tomentum on segments 2 to 3, but base of 4, apices of 4 to 5 and lateral margins of 6 with white tomentum.

*Variations.*—There seems to be little variation in this species. The following is the only one I have considered, and it is not very satisfactory.

variety **nigropectus** new variety.

Pleura, pectus and venter black pilose. Pale abdominal bands sometimes very narrow or even absent.

*Holotype.*— ♂, Highrolls, New Mexico, June 4, 1902, (Rehn and Viereck), [A. N. S. P. No. 6107].

*Paratypes.*— ♀, topotypic.

Of this form I have examined specimens from New Jersey, Pennsylvania, West Virginia, Georgia, South Dakota and Kansas, and these seem to be typical.

This form I suspect is conspecific with *hypomelas* Mcq., as a variety with fasciated abdomen. If this be correct, then *hy-*

*pomelas* can be separated from *alternata* only by the color of the pile on the pectus and venter.

A ♂, Elwyn, Pennsylvania (C. S. Welles) does not seem to have the fore tibiae bristly, but they may have been broken off, although I cannot find any trace of scars under high magnification.

**Villa hypomelas.**

1840. *Anthrax hypomelas* Macquart, Dipt. Exot., ii, 3, 1, 76, (pl. xxi, f. 1).

Pile of face, pectus, abdominal segments 3 to 6 and venter black. Abdominal segments black tomentose; lateral margins all pilose. Pile of segments 1 to 2 yellow or whitish; of apical segment white. Fore tibiae setulose; claws minute.

Described from North America.

It is a question to me whether this is a distinct species. It differs from males of *alternata*, var. *nigropectus* only in the absence of pale tomentum and lateral white pile on segment 4. These, however, are very faint on some specimens I have placed under *nigropectus*.

My limited series of this form does not contain any females, and this suggests to me the possibility that I have them among the females of *nigropectus*.

## Summary.

The species *lateralis* and *alternata*, as I have recognized them, may be separated as follows:

*Lateralis*. Slender, with abdomen two or more times as long as broad; lateral margins of segments 3-7, furnished with long cuneate scales, which are more or less mixed with pile; fore tibiae not bristly. Length.—7.0-12.0 mm.

*Alternata*. Robust, with abdomen ovate, not more than twice as long as broad; lateral margins of segments 3-7 furnished with long pile which is not intermixed with scales; fore tibiae bristly. Length.—12.0-16.0 mm.

It is probable that these species in most collections are correctly determined as regards the typical and normally developed specimens. But the varieties and undeveloped specimens will no doubt be found in confusion.

# Two new Aphids, Capitophorus shepherdiae and Siphocoryne aquatica (Hem., Hom.).

By C. P. GILLETTE and L. C. BRAGG, Fort Collins, Colorado.

(Plates XXIV, XXV.)

**Capitophorus shepherdiae,** n. sp., Plate XXIV.

In the *Journal of Economic Entomology,* 1915, page 379, attention was called to an aphid that had been found associated with *Rhopalosiphum hippophaes* and *Myzus braggii* on *Elaeagnus* and *Hippophaes* as over-winter hosts, which so resembled either of these species in general appearance as to be easily mistaken for them. This species has since been isolated, and its development followed through the year, proving it to be a different species and one that seems to be undescribed. This species may have an alternate summer host plant, but we have not been able to find one and the lice remained on *Shepherdia* all summer in 1915.

This species is readily separated from any other we know by the combination of three characters, as follows: spur of antenna less than one-half as long as the cornicle in the apterous form, cornicle clavate, and dorsum of abdomen conspicuously decorated with several rows of short, stout, capitate hairs. Descriptions of the different forms of this species follow. All measurements are in millimeters.

*Fundatrix.*—Color pale green, or yellowish green; dorsal surface set with numerous short, stout capitate hairs on small, cone-shaped tubercles, there being one marginal and three lateral rows on either side of the median line of the abdomen and metathorax; antennæ barely reaching to the abdomen, set on short tubercules, 5-jointed. first joint with rather prominent swelling on the inner side, giving it the appearance of being bent at a right angle; joint III as long as IV and V together; relative lengths of joints beyond the second varying little from the following proportions: 16: 8: 6: 7 (spur); total length, .50 to .60; primary sensoria only; vertex flat, but set with tubercles that bear capitate hairs; capitate hairs on antennal tubercles and joints I and II of the antennæ; cornicles rather long, (.40), slender towards the base, clavate distally, due to a thickening on the inner margin, and slightly curved outward near the distal end; cauda but little longer than its width at base, and somewhat blunt at the tip; legs rather short

and stout, the hind tibiæ measuring .50; length of body to base of cauda 1.40.

Described from many examples taken on *Shepherdia argentea* at Fort Collins, Colo., during the year 1915, by L. C. Bragg. See Plate XXIV, figures 1, 2, 3 and 4.

*Apterous Fundatrigene.*—General color a pale yellowish green to greenish yellow with transverse dashes of darker green, much as in the oviparous form; antennæ, legs, cornicles and cauda concolorous with the body, except that the tarsi and the last segment and spur of the antennæ are blackish; eyes dark red; capitate hairs as in the fundatrix and the egg-layer; body, 1.40 by .80; antenna, .75; cornicle, .43; hind tibiae, .56; antenna 5-jointed, ordinarily, with the segments measuring about as follows: III (III and IV in one), .28; IV, .14; V, .08; spur, .16. In occasional examples a swelling near the middle undoubtedly indicates the location of a former joint between the segments, and in such examples the basal portion (old third joint) is a little longer than the distal portion, the ratio being about as 7 to 5. See Plate XXIV, figure 5.

Described from numerous examples taken from *Shepherdia argentea* growing on the grounds of the Colorado Agricultural College, July 1st, 7th and 20th, 1915, by L. C. Bragg

*Alate Fundatrigene.*—Color light-green with dorsum of head, thorax, meso-sternum, and a large quadrate area on the abdomen dusky or dark-green to blackish; antenna blackish except joints 1 and 2 and the extreme base of 3, which are pale greenish; legs greenish, except at the distal ends of the tibiæ and the tarsi which are blackish; distal half of the cornicles dusky; cauda and beak green, the latter attaining the 2nd coxæ; three dark-green spots upon either lateral margin of the abdomen; eyes dark-red, front of head considerably produced and bearing about 4 capitate hairs; first joint of antenna moderately gibbous on the under side; capitate hairs occurring on the pronotum, anterior lateral angles of the mesothorax, and in longitudinal rows over the abdomen; length of body about 1.30 to 1.50; wing, 2.50; antenna about 1.10 to 1.20; proportions of joints beyond the second about as follows:—100; 85; 90; 40: 100 (spur); cornicle, .40; cauda, .12; numerous (20 or more) oval sensoria on joint III of the antenna; joint IV with about half as many; joints V and VI with permanent sensoria only; beak attaining 2nd coxæ. See Plate XXIV, figures 6 and 7.

Described from numerous examples taken from *Shepherdia argentea,* Fort Collins, Colo., June 19, 1915, by L. C. Bragg.

*Male.*—Resembles the alate fundatrigene but is much smaller, about 1 mm. in length; antenna (figure 10) about 1.15 long, joint I strongly gibbous, joints II and III with sensoria about as in alate virgogene, joint V with about 10 to 12 sensoria; cornicles about .33; claspers black; cauda dusky; hind tibia .66.

Described from four specimens, two taken October 20, and two taken September 28, 1915, at Fort Collins, Colo., by L. C. Bragg, from *Shepherdia argentea.*

*Oviparous Female.*—Resembles the other apterous forms of the year very closely, is more yellow in color, averages a little longer than the stem-mother; antenna about .80, or nearly once and a half as long as the antenna of the stem-mother. Segments 3 and 4 united in one as in the other apterous forms; cornicles, .45; hind tibiæ moderately swollen throughout nearly their entire length, and with many small sensoria, see figures 8 and 9.

Described from specimens taken by Mr. L. C. Bragg, at Fort Collins, Colo., from *Shepherdia argentea*, Oct. 20, 1915.

**Siphocoryne aquatica,** n. sp., Plate XXV.

*Alate Virgogene.*—Head, thorax, antennæ, tarsi, distal ends of tibiæ, and cauda black or blackish; abdomen green with transverse dashes or blotches on most of the abdominal segments, which, in some, form a continuous area on segments 2, 3, 4 and 5. These dark markings largely disappear in balsam. Length of body 2; wing 3; cauda .20; antennæ 1.10; cornicles clavate without flange; venation normal; third joint of antenna with about 14 nearly circular sensoria; permanent sensoria ciliated; joint 3 about twice as long as 4, and joints 4, 5, 6 and spur sub-equal; a small but distinct wart-like tubercle on the hind margin of joint 8 of the abdomen, just before the cauda; figures 1, 2, 3, 4.

This is a very common louse on a water-grass (*Catabrosa aquatica*) growing on seeped land, usually found in the water along the margins of ditches. The lice often occur on leaves and stems beneath the water where they seem to be perfectly at home. This louse remains on the grass throughout the year, and has been found alive under ice following temperatures as low as 15 to 20 degrees below zero. We have made collections at thirty different dates in ten different years. Both alate and apterous forms have been taken in every month of the year, and, apparently, they occur at all times. No sexual form or eggs have been recognized. Mr. Bragg took this

species on sweet-grass in Cherokee Park (Campton's), Feb. 27, 1916, at an altitude of 7800 feet.

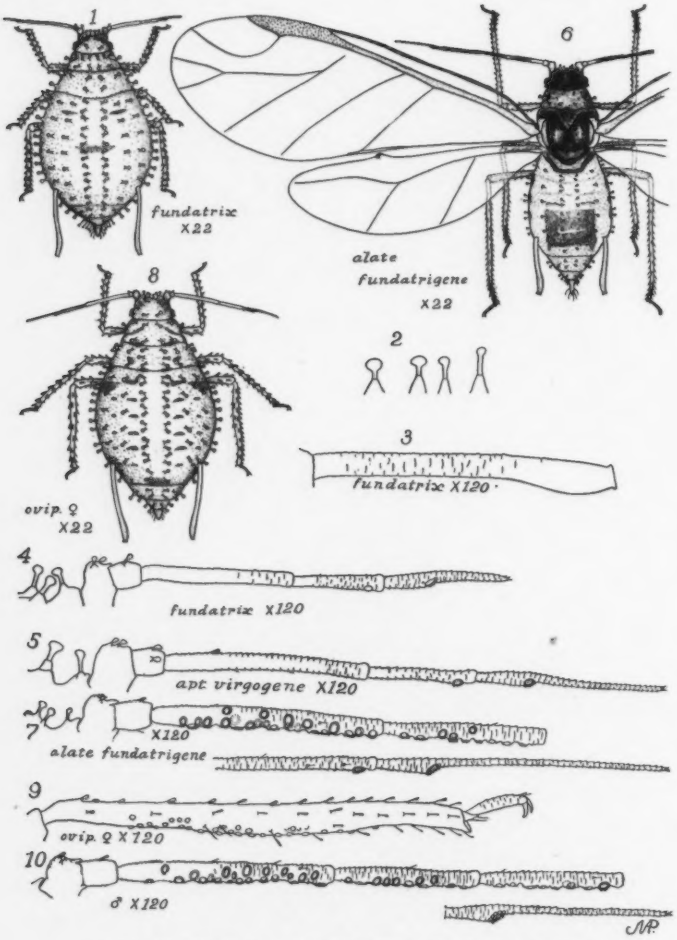
*Apterous Virgogene.*—Color light yellowish green, almost exactly the same as the grass leaves upon which it lives; rather heavily covered with white powder on the ventral surface, but little on dorsum; general form rather elongate (about 2.60 long by .70 to 1 broad); length of antenna, .85 to .95; cornicles and joints 1 and 2 and distal half of antennæ, dusky to black and powdered throughout; eyes prominent and black; legs yellowish and covered with powder; tarsi dusky to black; cauda concolorous with body or dusky, rather bluntly pointed at tip; beak short, barely attaining 2nd coxæ; cornicles weak recumbent on the abdomen, concolorous with the body with the extreme tips blackish, in form clavate, in the shape of a baseball bat, but with the small end attached to the body and with the free end rounded off and without any flange present; length, .25 to .30 The entire body is free from hairs, but has a roughness due to what appear to be minute wrinkles. The antenna is 6-jointed, joint 3 being about twice the 4th, and joints 4, 5, 6 and the spur are sub-equal; vertex, strongly convex.

A striking peculiarity of this species is a rather prominent tubercle on the middle of the hind margin of the dorsal segment preceding the cauda in the apterous form. The tubercle is present but quite small in the alate form. In some examples the third joint of the antenna has from 2 to 4 sensoria which are rather indistinct and possibly only vestiges as the merest outlines are all that can be seen, and these are sometimes more or less broken and irregular. Their location is as shown in Plate XXV, figure 2. The antennae are upon short but distinct tubercles, Plate XXV, figures 5, 6, 7 and 8.

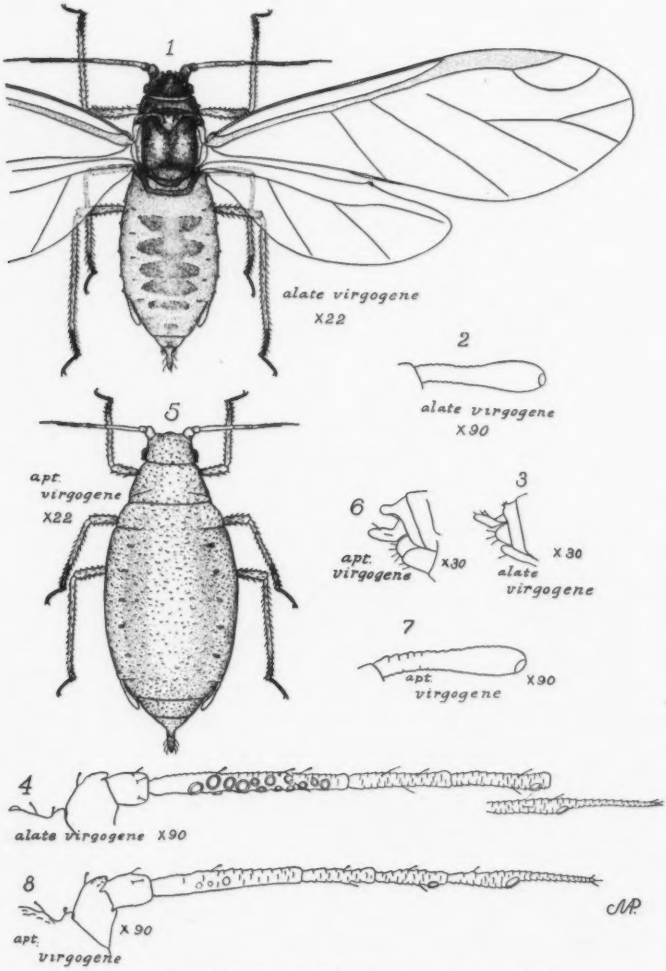
EXPLANATION OF PLATES XXIV, XXV.

Plate XXIV. *Capitophorus shepherdiae* n. sp.: 1, Fundatrix; 2, capitate hairs on tubercles; 3, cornicle; 4, antenna and vertex of same; 5, antenna of apterous fundatrigene; 6, alate fundatrigene; 7, antenna and vertex of same; 8, oviparous female; 9, hind tibia of same; 10, antenna of male. Figures 1, 6 and 8 x 22 diameters; other figures 120 diameters. Original. Miss Miriam A. Palmer, delineator.

Plate XXV. *Siphocoryne aquatica* n. sp.: 1, alate virgogene; 2, cornicle; 3, last three abdominal segments; 4, antenna of same; 5, apterous virgogene; 6, last three abdominal segments; 7, cornicle; 8, antenna of same. Figures 1 and 5 x 22 times; figures 3 and 6 x 30 times; figures 2, 4, 7 and 8 x 90 times. Original. Miss Miriam A. Palmer, delineator.




CAPITOPHORUS SHEPHERDIAE—GILLETTE & BRAGG.




SIPHOCORYNE AQUATICA—GILLETTE & BRAGG.

# Notes on the Genus Hemiargus Hübner in Dyar's List (Lep.).

By G. T. Bethune-Baker, Edgbaston, Birmingham, England.

Months ago my friend, Dr. McDunnough, wrote to me in reference to the confused state of *Lycaena hanno* Stoll, and asked if I would attempt to clear up the synonymy of it and its near allies. The only way to do this was to see Boisduval's types and also to endeavor to settle whether *antibubastus* Hb. was the same species as *hanno*. The oft-experienced and renewed kindness of Monsieur Charles Oberthür has relieved me of the first difficulty, for he has been so good as to send me all the necessary specimens from the Boisduval section of his magnificent collection, so that, with these before me, the second point will be easier.

In Dyar's list we find all these species grouped as follows under the genus *Hemiargus*:

**Hemiargus** Hübner.

444 **isola** Reakirt, Proc. Acad. Nat. Sci. Phil. 332—1866.
Syn. *zachaeina* Butler & Druce—*alce* Edwards.
445 **gyas** Edwards, Trans. Am. Ent. Soc. iii. 210—1871.
446 **cyna** Edwards, Trans. Am. Ent. Soc. ix. 3—1881.
447 **hanno** Stoll, Pap. Exot. Suppl. pl. 39 f. 2—1790.
Syn. *antibubastus* Hübner, *hamo* Lucas, *pseudoptiletes* Boisduval & Le Conte, *astenidia* Boisduval (recte *astenidas*), *filenus* Poey.
448 **ammon** Lucas, Sagra Hist. Cuba. vi. 612—1856.

Taking these into consideration seriatim, we have first to settle the genus *Hemiargus* Hübner.

Scudder (Hist. Sketch p. 186) names *bubastus, parsimon* (*celaeus*), *lysimon* (*ubaldus*), *hanno, isis* (*isarchus*) , *larydas,* and he says *hanno* may be selected as the type. In making this selection he gives Hübner's Verz. Bek: Schm. p. 69, as his only reference and he dates that work as 1816. We know, however, today that that date is an error; pages 65-80, with spp. 622-819, cannot have appeared earlier than 1822 (Durrant and Sherborn both agree on this point). This is proved by the fact that these pages of the *Verzeichniss* have several references to his (Hübner's) earlier work, the *Zuträge,* in them,

the first of which is to the genus we are considering. His first species is "*Hemiargus bubastus* Hübn. Zutr. 99-100." These figures are on plate 509, and the legend at the bottom of the plate is "99-100 *Hemiargus antibubastus.*"

In Hübner's and Geyer's text belonging to this volume, the species and plate are referred to as "*Hemiargus antibubastus,* Zutr. I, figs. 99-100," and the preface to this part I of the Zuträge is dated 22-XII-1818, so that it is evident that if it did not appear before the end of 1818 it must have appeared early in 1819; in addition to other references there is on p. 74 of the *Verzeichniss* No. "730 *Lycus niphon,* Zuträge 203-204," which plate was issued in Part II of that work, the preface to that part being dated 23-XII-1822, whilst the Title is dated 1823. These references prove that the *Verzeichniss* could not have been issued before the end of the year 1822, therefore *Hemiargus bubastus* (1822) falls as a synonym to *Hemiargus antibubastus* (1818) if it should happen to be the same species. The genus *Hemiargus* was at its institution a monotypical genus, containing only *antibubastus.* This species, therefore, is its type, and as a consequence Scudder was acting *ultra vires* in selecting *hanno* as type. We get, therefore:

*Hemiargus* Hübner, monotypical genus, type *antibubastus.*

Returning now to Dyar's list, his first species is

**H. isola** Reakirt.

The genitalia of this species are extraordinary in that there is a large toothed hood above the furca, occupying an intermediate space between the tegumen and cingulum and the harpagines; it has its origin just above the very short furca; the aedoeagus is also different somewhat to the others of the genus, but in other characters the species would appear to be rightly placed in this genus.

**H. zachaeina** Butler & Druce.

This species has nothing to do with *isola;* it has two distinct anal spots with metallic edging in the hind wings and therefore belongs to the *catilina* group; it will be referred to

later on. Dyar probably placed it as a synonym of *isola,* because Butler & Druce's supposed ♀ is *isola,* as stated by Godman and Salvin in the *Biologia* II, p. 107, where they rectify the synonymy.

**H. gyas** Edwards.

This species is described by Edwards as having *two* distinct blackish spots next the anal angle. I have, therefore, little doubt that it is a near ally of *catilina* Fab.; it may be a local form of it. *Catilina* is a species that has escaped observation altogether until recently. It is close to *ammon* and will have to be referred to again later on.

**H. cyna** Edwards.

Edwards says this species stands next to *gyas,* but the description is very different from it, while the genitalia are totally diverse, so much so that the two species cannot possibly belong to the same genus. *Cyna* has a number of very long, stout hairs or bristles emanating from the base of the clasps (harpagines) and extending far beyond their apex; this peculiar character is analogous to the same feature that occurs in the genera *Zizina* and *Zizula;* the tegumen is, however, very different so that I think it is rather a case of parallelism than of kinship.

**H. hanno** Stoll.

The species generally accepted as *hanno* Stoll (nec Hübner) is that represented by Holland, Plate XXXII, f. 3, in his *Butterfly Book,* and by W. G. Wright, Plate XXX, figs. 397-397a. His figure 397b is certainly another species. I do not see anything antagonistic to Stoll's figures (Plate 39, 2 and 2b) in these identifications, and I think they should be accepted. It is, therefore, a species with a single distinct ocellated spot at the anal angle. *H. filenus* Poey and *pseudoptiletes* Bdv. are both synonyms of it. Poey's figure is very good and is without doubt *hanno,* though the undersurface is darker than is the case with most of the mainland specimens. Boisduval was aware that his *pseudoptiletes* was the same as *filenus,* for he

adds a footnote to his description, after correcting the synonymy at the head of his species:

"cette espèce port sur nos planches le nom de *Pseudoptiletes*, parceque la gravure et l'impression étaient terminées avant que M. Poey eût publié les deux livraisons des centuries des Lépidoptères de l'île de Cuba; nous avons du par conséquent adopter le nom de *Filenus* pour ne pas compliquer une synonymie deja trop compliquée."

**H. antibubastus** Hb.

This species certainly is not a synonym of *hanno;* neither is it *bubastus* Cramer, Pl. 332 G. & H., to which Hübner refers in his *Verzeichniss,* p. 69, No. 676. I have referred to Cramer's beautiful original drawings, which are now in the possession of the British Museum at South Kensington. These are most carefully painted; the spots and markings of the under surface are delineated with the utmost care and delicacy; there is no cell spot at all, and the post-median line is not fractured, but is slightly angled in the primaries; neither has it any subterminal row of spots, there being merely a fine twin crenulate white line; in the secondaries the second costal spot is projected outwards, the post-median line is not fractured; at the anal angle there is a spot with an orange iris. On the upper surface the color is uniformly brown, with no markings except two anal spots with traces of two other marginal spots above them. All the spots of the under surface are small, round ones, finely encircled with white. The locality is the Cape of Good Hope. The whole pattern of Hübner's *antibubastus* is quite different from that of Cramer, and I have no hesitation in saying they represent two quite distinct species; the locality given by Hübner is Georgia, so that their habitats are widely separated. I am quite unable to identify this with *hanno,* as is done by Dyar. The black spots of the primaries, with their definite white encirclings, preclude its being *hanno;* it is very much nearer *isola,* but I should not be disposed to make *isola* a synonym of it. It is very unfortunate that Hübner's types are not known. He painted from specimens lent him by correspondents all over Europe and beyond, and as a consequence the collections where his types might be are unknown.

**H. hamo** Lucas in Sagra.

I identify this with *hanno* Hb. (nec. Stoll), which equals *ceraunus* Fab., and will be referred to later.

**H. astenidia** Bdv. ms. (recte *astenidas*), Lucas in Sagra.

Through the kindness of my good friend, M. Ch. Oberthür, I have the female type of this species before me, as I also had of *pseudoptiletes;* the ♀ type is without any question *Chilades trochilus,* a well-known Mediterranean and Eastern insect. That fact, however, does not affect the name of the male, as its description came first. I have been unable to trace Boisduval's description, and I understand that it was first described by Lucas in Sagra as follows: "♂ supra, cyaneo violaceis margine fuscente fimbriaque albicante. ♀ Supra fusconigricantibus, basi cyaneo virescente, etc." At the end of the account of this insect he goes on to say: "usually the female is without any blue." I think, therefore, that the female without any blue is probably the one M. Oberthür has kindly lent me, and has nothing to do with *astenidas* vera. The description suits *hanno* well, and I am quite prepared to accept Dyar's conclusion that the name *astenidas* should fall as a synonym of *hanno.*

**H. ammon** Lucas in Sagra.

This is a delicate little insect of a clear lavender blue with two dark anal spots, the upper one of which is edged above with red, the fringes are tessellated black and white. The wings are so delicate that the underside markings show through. The underside is whitish gray and all the markings are encircled with white. In the primaries there is a quadrilateral spot at the end of the cell followed rather closely by a continuous band of six confluent spots, making a band rather than a row of spots; below the sixth there is a smaller one that is discontinuous; a broad white area follows this and is succeeded by a broadish irregular, pale brown stripe, beyond this being the broad white margin in which is a series of pale brown internervular dots.

The secondaries have the usual three black basal spots below each other with another costal one (black) near the apex; the cell is closed by an angled pale brown mark, close to which is the transverse row of seven more or less isolated spots beginning below the black costal one, the second is projected right outwards, the third and fourth confluent inwards, the fifth further inwards, the sixth outwards, the seventh

right inwards on the inner margin; this series is followed by a broad irregular white area and the marginal series is like that in the primaries except that the inner brown line is fine and the brown internervular spots larger; there are two black anal spots beautifully iridescent with metallic pale blue, and the upper of the two spots has a broad red crescent on its inner edge.

♀. Blue of a purer or truer blue than the male and covering more than three-quarters of the primaries and four-fifths of the secondaries; the wings are of the same delicate texture as in the male, the pattern below being precisely that of the male.

I am indebted to M. Oberthür for the loan of this beautiful little species. Holland's figures on plates 30 and 31 in his *Butterfly Book* give a fairly correct representation of the species found on the mainland, but it is considerably different from the Cuban insect and is certainly distinct from it; it is, I have little doubt, *catilina* Fab.

**H. catilina** Fab.

This species was described by Fabricius in his Ent. Syst., Vol. III, p. 304 (1793). The description is probably taken from a female, the underside being described as "pallidiores fasciis plurimis albis, angulus ani ocellis duobus dimidio cæruleis atrisque." "Habitat in Americae meridionalis Insulis Dr. Pflug." In the British Museum (South Kensington) there are specimens from Haiti and St. Domingo which agree accurately with the descriptions of Fabricius and they also agree equally precisely with Holland's figure (l. c.), Plate 30, f. 45.

The differences between this and *ammon* are easily recognizable in the primaries on the underside. The transverse row is not a continuous band but is an irregular row of separate spots touching each other; in the secondaries the basal series of dark spots consists of four, there being an additional one just below the cell; in *ammon* there are only three spots, viz.: below the costal vein, in the cell and on the inner margin; in *catilina* the color is gray up to the transverse band in both wings, throwing up the white postmedian area strongly in contrast. *Ammon* has the underside much whiter all over. Again, the upperside has none of the delicate tone of *ammon*, but is, as Holland describes it, lilac blue; it is quite

solid in texture and shows none of the underside markings through. *Catilina* is also a larger and more robust species. The specimens of *ammon* before me measure 20-21 mm. against 26 mm. in *catilina*. I have a good series from Arizona and Florida in my collection which were sent me as *ammon*, but after comparing them with the Cuban insect and with the series in the National collection here, I have no doubt that they represent *catilina*.

**H. zachaeina** Butler & Druce.

I have already referred briefly to this species, the types of which are in the British Museum, there being a fair series there.

It appears to me to be quite distinct from *catilina*, though a close ally. It very probably replaces that insect in its own regions. Its color is violet blue, almost exactly like *hanno* above, but the underside is near to *catilina*, the differences being that the transverse band in the primaries is much nearer the termen, quite a different shape, being oblique, not more or less curved, and being very irregular; there is no white space between it and the submarginal rows of markings which it touches; the same characters apply to the secondaries except that there is a very slight white postmedian trace. There are two anal black spots with metallic blue, the upper and larger of which is edged internally with a red crescent.

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We still have to consider two other insects, *Hesperia Rurales ceraunus* Fabricius (Ent. Syst. III, p. 303, No. 149) and *Rusticus adolescens hanno* Hübner (Samml. Exot. Schm. I, Plate 98, ff. 1-4). In Wytsman's reprint of the latter work, Kirby (vol. III, p. 72) refers Hübner's *hanno* to *ceraunus* F. and from Fabricius' careful description (l. c.), where he mentions the most important characters, I have no hesitation in accepting Kirby's allocation. I am glad to be able to confirm this from another source, and I have to thank M. Oberthür again for this opportunity. Among the specimens he was so good as to send me are two, one from Boisduval's collection and one from Gueneè's; that from the former is labelled in,

I believe, Boisduval's writing: "Rusticus adolescens hanno Hübner (Samml. Exot. Schmetterl., pl. 117, figs. 1-4)." The reference here is a clerical error; it should be 98; plate 117 has only two figures on it of *Papilio erithonius*. The specimen is certainly the same as Hübner's figures and the example from Gueneè's collection is the same, both of which agree with the description of Fabricius. The species is the smallest of the genus, the color is dull violet blue, the markings and pattern of the underside being very small but fairly distinct. The color is dull dirty gray, with the spots of the same hue encircled finely with white; the transverse postmedian row of spots is very near the termen, and there is no white area at all; in the secondaries the same applies, but there are in addition the four black spots which are so marked a feature in this genus. There is only one anal spot and therefore its position should come next to *hanno* Stoll.

I would tabulate the genus thus:

**Hemiargus** Hübner.

Hübner Saml. Exot. Schm. Zuträge ff. 99-100, p. 16, No. 125, 1822 or 3. A monotypical genus, type *antibubastus*.

**isola** Reakirt. Proc. Acad. Nat. Science, Phil. 332. 1866.

**antibubastus** Hübner. Zuträge l. c. 1822 or 1823.

**catilina** Fabricius. Ent. Syst. III. p. 304. 1793.
*Lycaena ammon*. Holland Butt. Book p. 270, Pl. xxx f. 45, xxxi f. 31.

**gyas** Edwards. Trans. Am. Ent. Soc. III, 210. 1871.
Whether this and the following species are the same I am unable to determine.

**zachaeina** Butler & Druce (partim). Cist. Ent. I, p. 104. 1870.

**ammon** Lefebvre. Lucas in Sagra. Insectes p. 612. 1857.
This species does not, I believe, occur on the mainland. In the British Museum there are specimens from Cuba—Santiago and Bahamas.

**ceraunus** Fabricius. Ent. Syst. III. p. 303. 1793.
Syn. *Rusticus adolescens hanno* Hb. Saml. Exot. Schm. Taf. 98, ff. 1 to 4. *Lycaena hanno* Lucas in Sagra, Insectes p. 612.

**hanno** Stoll. Exot. Schm. Zuträge p. 170 Pl. xxxix. f. 2.2b. 1790. id. Holland. Butt. Book p. 269, Pl. 32, f. 3, 1905.
Syn. *Polyommatus filenus* Poey. Centur: des Lep. de Cuba,

1832. *Argus pseudoptiletes* Boisduval & Leconte. Hist. Gen. Lep. Am. Sept., p. 114, Plate 35, ff. 5 to 7, 1833. *Lycaena astenidas* (Bdv. MS.) Lucas in Sagra. Insectes. p. 613. 1857.

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**cyna** Edwards. Trans. Am. Ent. Soc. ix, p. 3. 1881.
This species should not be included in the genus. The pattern is different and the genitalia are so completely different that I think it should be excluded from *Hemiargus*.

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## Some new California Geometridae (Lepid.).

By W. S. WRIGHT, San Diego, California.

**Laurentia switzeraria** n. sp.

Expanse 31 to 33 mm. General color dark smoky brown. Basal line about one-fifth out, nearly straight from costa to median vein, then a strong outward scallop to anal vein, thence straight to inner margin. Beyond is a broad light-colored band sprinkled with brown scales. The very broad mesial band is wider on the costa than on the inner margin, the center being the palest part. The inner edge is perpendicular to the inner margin of the wing; a strong outcurve occurs between vein one and the median. The outer line is scalloped throughout its entire course; a blunt tooth occurs on the subcostal; a rather prominent tooth on vein six, another between three and four, and a strong incurve to another small tooth just above vein one. From the tooth on vein six a wavy black line runs obliquely to the apex. The whole wing surface is covered with subparallel brown lines. These lines are most noticeable in the subterminal space where they are marked on the veins by dark brown scales.

Secondaries even smoky above with faint indications of cross lines at the anal angle. A faint line shows through from the under side near the middle of the wing.

Beneath, the primaries are smoky with whitish along the costa and indications of cross lines along the outer third, apex and margin. Secondaries somewhat lighter, heavily sprinkled with brown scales. There is a narrow whitish band just beyond the middle of the wing outlined on the inner edge by a row of brown dots on the veins. There are indications of faint brown lines beyond to the margin. Discal dots on both wings.

*Type*, one male, March 17, 1912, San Diego, California. *Paratypes*, eight males, February to March, 1912, San Diego; one male, March 12, 1912, San Diego, with L. W. Swett, two males with Geo. H. Field, San Diego, and two males in the American Museum of Natural History, New York.

The species shows a rather remarkable tendency to variation. In some specimens the defining lines are almost obsolete, the bands being defined simply by a varying depth of the ground color. In some the apical oblique line is indicated only by a few brown scales. In one specimen the defining lines are deep velvety black and extend only from the inner margin to the subcostal vein.

**L. switzeraria** n. var. **swettaria.**

A series of six males of the above species is remarkable in having a nearly white band running through the mesial brown band from costa to inner margin of the primaries. The variety is separated on the advice of Mr. L. W. Swett, to whom I dedicate it.

*Type,* one male, February 21, 1912. *Paratypes,* three males in the author's collection, two in Mr. Swett's collection, one in Mr. Field's collection and two in the American Museum of Natural History, New York.

This species has many of the characters of *Hydriomena,* and it was so placed until Mr. Swett called my attention to the fact that the antennal structure threw it out of that group. No genus could be found that seemed to fit, and we are not sufficiently acquainted with the European genera to make sure that none of them will fit, so we have decided to follow our European friends and place it in a genus that will serve for the present, or until a close study of related genera either finds the right one or makes necessary the erection of a new one. *Laurentia* seems to be the nearest genus to the *Hydriomena*-like group, so here it is placed tentatively.

**Melanolophia unipunctaria** n. sp.

Alar expanse 32 mm. Antennae of male with short blunt pectinations finely ciliated beneath. Head rufous gray. Thorax darker, speckled with black. Abdomen gray, speckled with black, showing dense patches of black scales on some of the joints dorsally.

Primaries white, evenly densely speckled with dark brown and blackish scales. Basal line dark brown, at inner quarter gently curving outward from costa to median, then straight to inner margin. A second line at the half subparallel to first line, evenly dentate and zigzag. A third line at about the two-thirds, starting from a heavy blackish

mark on the costa runs outward to subcostal then angles sharply backwards running nearly parallel with outer margin to inner edge. Just beyond this line in the costal area is a large red-brown patch before a fine black line and at the lower outer corner, about half-way between the third line and the outer margin is a small roundish white spot, quite conspicuous. Another subquadrate red-brown patch lies close to the third line near its middle in the sub-terminal area. A dark brown linear mark on costa near apex. In the submarginal space the speckles are a little thicker than elsewhere, simulating a broad marginal band. A row of blackish brown spots at base of fringe which is concolorous with the wings and faintly checkered.

Secondaries concolorous and evenly speckled. Two very faint brown lines cross the wings. Discal dot small but prominent. A narrow terminal brown line. Wings sharply angled or toothed near the center of outer margin.

Beneath, much as above except lighter with tinges of ochre. Second line showing through and continuous across both wings. Discal dots very distinct. Faint indications of a white spot near apex of primaries.

*Type,* one male, Glen Alpine Creek, Tahoe, California, June 25, 1915, by E. P. Van Duzee, in the author's collection. *Paratype,* one male, same data as type, in University of California collection.

I hesitated some time before giving this beautiful species a name, but have finally decided to do so at the risk of making a synonym. The venation and the peculiar formation of the hind tibia place it unquestionably in *Melanolophia,* and its size, together with other superficial characters, distinguish it from *M. canadaria,* to which it seems most nearly allied.

**Hydriomena edenata** Swett.

Some years ago Mr. George Field had from me a number of specimens of this species unknown to either of us at that time. He sent them to the late Mr. Frank Merrick for identification, and they came back labeled *H. autumnalis.* Thus they stood in our cabinets until recently, when I was led to give them some study. I found them to be *H. edenata* Swett, and also discovered that there were two perfectly good varieties in the series. I sent the entire series to Swett for examination and comparison with the types. Swett confirmed my judg-

ment as to the species being *edenata,* also as to the varieties, pointing out, however, that one of the varieties appeared to be a rediscovery of one of Packard's species, *H.* (*Cidaria*) *glaucata.* This variety I have called *olivata* n. var.

Packard says of *glaucata* "pale glaucus green," *olivata* is dark. In *glaucata* the extra discal space is quite wide on the inner margin and the black bar on this margin is absent; in *olivata* the extra discal space is very narrow and the black bar is evident on the inner margin. The fore wings are elongated in my variety, while in *glaucata,* as figured in Packard, the fore wings are more rounded, as in the European *ruberata,* of which it may be simply a green variety. In view of these differences I feel that the new name is justified.

**Hydriomena edenata,** n. var. **olivata.**

*Olivata* is separable from the typical *edenata* by the following differences; basal area concolorous, narrowly linear first line, which is also different in its course, running in long even sigmoidal curves from costa to the middle of the inner margin, there being no sign of an angle on the subcostal vein: bar on inner margin lacking or but faintly indicated; no contrasting colors but rather a dull mottled appearance brought about by the rather indistinct breaking up of the bands, none of which is distinctly traceable. The whole surface of the primaries is suffused with a distinct olive shade. The hind wings show a very definite brown extra discal line and a faint rather diffused line in the middle of the space beyond. In one specimen the mesial space is a little lighter and nearly immaculate.

*Types,* three males, San Diego, California, collected by the author, one of which is in the Swett collection.

**Hydriomena edenata,** n. var. **pallidata.**

The second group of specimens, under the name of *pallidata,* is separable on the course of the first line which is straight from costa to inner margin; the absence of the black bar and the fact that the "usual wide irregular bluish band" of *edenata* has become, with the corresponding bluish band in the subterminal space, a light watery gray and is the most prominent marking on the primaries. All the lines are broken up, and more or less linear. The whole aspect is as though the specimens were very much faded.

The *type* is in the author's collection, *paratypes* in the Swett and Marloff collections.

## Some Carpenter Bees (Hym.).

By T. D. A. COCKERELL, Boulder, Colorado.

The Xylocopine bees listed below were received from the Queensland Museum. Two prove to be undescribed; the types are in my collection. The others mostly represent new localities.

**Xylocopa valga** Gerst. Ras-el-Ma, Algeria, ♀. (Queensl. Mus. 39.). Alfken records *X. valga* from two localities in Algeria.

**Xylocopa amedaei** Lepel. Ras-el-Ma, Algeria, ♀. (Queensl. Mus. 40.). Originally described from Algeria.

**Xylocopa brasilianorum** (L.) "Guyane, Maroni." ♀. About 21 mm. long, wings not quite so dark as usual (Queensl. Mus. 13.)

**Xylocopa medionitens** sp. n.

♀. Length about 22.5 mm., anterior wing 17 mm., width of abdomen nearly 9.5 mm.; black, with black pubescence, but that on thorax above fox-red, leaving a shining median area extending to anterior margin of mesothorax, its anterior portion with black hair; head 7 mm. wide, tubercles of labrum ordinary; clypeus with large and coarse, not dense, punctures; upper part of clypeus bounded by a shining swollen rim, which has a small tubercular projection in middle; hair of head entirely black; extreme end of scape, and second antennal joint, largely red; third joint little longer than next two together; flagellum greyish-brown beneath except at base; pleura black-haired; tegulæ black; wings reddish-fuliginous, subtranslucent, the apical field darker, iridescence pale golden, the apical region coppery; venation normal; legs black-haired, hind tibiae with a smooth shining space on outer side; abdomen shining, black-haired, well punctured, with a rather indistinct median keel above and a distinct one below.

*Hab.*—"Guyane, Maroni" (Queensl. Mus. 7). From Enderlein's short description, this might be *X. rufidorsum* Enderl., from Peru; but the wings appear to be lighter and differently colored, and the very difficult locality would suggest a distinct form. Enderlein says that his insect, except for size, recalls the African *X. mixta;* but *X. medionitens* does not suggest *mixta.* Among the African species it resembles *X. carinata fulvopilosa* Friese. In Schrottky's table the new species falls nearest to *X. aurulenta* (Fab.), to which it is evidently allied, but the size is quite different, and Lepeletier says the sides of the thorax are red-haired in *aurulenta.*

From *X. similis* Sm. it is known by the absence of red hair on first abdominal segment.

**Xylocopa frontalis** (Olivier.) var. **morio** (Fabr.). "Guyane, Maroni." ♀ ♂. (Queensl. Mus. 1, 2). The female has the wings black, shining green. The *morio* form is perhaps a distinct species. *X. frontalis* proper, from Paraguay, has the wings shining purple.

**Mesotrichia ceramensis** sp. n.

♂. Length about 20 mm., anterior wing 18 mm.; robust, densely covered with short pale pubescence, which is whitish-ochreous (hoary) on head, thorax and first abdominal segment, warm ochreous on the rest of abdomen; eyes prominent; small spot at base of mandibles, large spots at extreme sides of clypeus (extended mesad more or less to form a submarginal band), and stripe down middle of clypeus, dull yellow; scape in front (except apically), and flagellum beneath (except at base) ferruginous; front, vertex and sides of face with some admixture of dark hair; no black hair at sides of abdomen; last ventral segment of abdomen with a median keel; femora with very scant hair, largely black; front and middle tibiae with pale hair, much like that of thorax; hind tibiæ with ochreous hair on outer side, in the midst of which is a bright rufous band, but beneath the hair of these tibiæ is partly black; anterior and middle tarsi with long hair, deep fox-red in front, paler behind; hind tarsi with rufous hair on outer side and black on inner; lower border of hind femora with a shallow broad median excavation; hind tibiæ with a large apical tubercle on inner side; wings yellowish-brown, first transverso-cubital nervure nearly obsolete.

*Hab.*—East Ceram, 1913 (*H. Elgner*). Queensland Museum, 15. A female of *Mesotrichia unicolor* (*Xylocopa unicolor*) comes with the same data (Queensl. Mus. 14), and I might have supposed the new form to be its male, but for the fact that the male of *M. unicolor* (already recorded from Ceram by Friese) is known and has a yellow clypeus. *M. ceramensis* is very close to *Xylocopa* or *Mesotrichia provida* (Smith), judging by Smith's description, but Bingham has examined males of *provida* in the British Museum, and cannot separate them from *M. bryorum* (L.). Our insect is quite distinct from *bryorum*, and is especially to be known by the pallid (not at all greenish) hair of the head and thorax.

**Mesotrichia torrida** Westwood. N. Djole, Gabon, ♂. (Queensl. Mus. 3.)

**Mesotrichia calens malagassa** (Saussure). Miarinarivo, Madagascar, ♀. (Queensl. Mus. 10.). Described by Saussure in 1891 as a variety of *Xylocopa olivacea*.

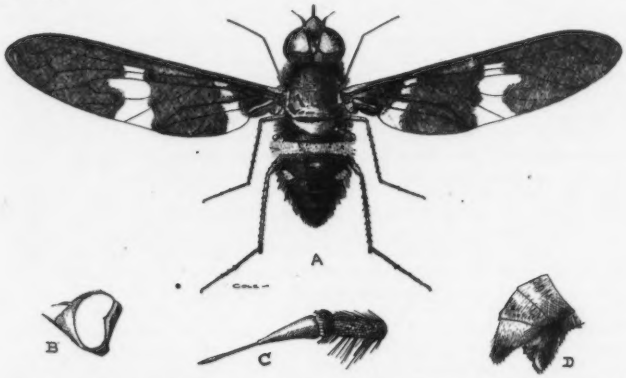
# A new Species of Exoprosopa (Dip.).

By F. R. Cole, Bureau of Entomology, U. S. Department of Agriculture.*

**Exoprosopa celer** sp. nov.

♂. Length 9 mm. Wing 12.5 mm. Face yellowish brown, the color extending a short distance above antennae. Front blackish, with yellowish tomentum and short black pile. Short black pile on face. Occiput blackish with silvery white tomentum near orbits, thicker near emargination of eyes. First joint of antennae reddish brown, the second and third joints black. Arista as long as third joint.

Thorax blackish, semi-shining. Scutellum dull reddish brown, black at base.




A. *Exoprosopa celer* sp. nov. B. Lateral view of head. C. Antenna (much enlarged). D. Anal segments of male from side.

Abdomen light reddish brown, first segment black. Black stripe on dorsum of abdomen, gradually narrowing from base, and reaching only about half way on sixth segment. Black does not quite reach posterior margin of segments. Abdomen with black tomentum. White tomentose cross-band at base of second abdominal segment. White spot on each side of third segment near posterior margin.

Legs reddish. Front tarsi darkened and very slender.

Wings very long and narrow, and deep brownish black in color. Narrow hyaline cross-band near base of wing, clear only in anal and axillary cells. Hyaline band in center of wing reaches to marginal cell.

*Type*—United States National Museum, Cat. No. 20,295. One male.

*Habitat*—East Highlands, California, Sept. 17, 1914.

This handsome species appears to have no closely related forms among those so far described. Only one specimen was collected. It is a very swift flyer, alighting on rocks and sand in the hot sun.

*By permission of the Secretary of Agriculture.

**Effects of a Spider Bite (Arach., Aran.).**

[Really good spider-bite stories come in occasionally and are worth placing on record. Therefore, I am sending you one of the latest, most intelligent and circumstantial accounts which has come to me. The spider was, in all probability, *Latrodectus mactans*, as I have informed Corporal Hutcheon. If you think it would be worth while to publish it in the News, I trust that you will do so.—L. O. HOWARD.]

Richmond, Virginia, August 2, 1916.

DR. L. O. HOWARD,
U. S. Department of Agriculture,
Washington, D. C.

Dear Doctor:

I am taking the liberty of addressing this note to you in the thought that the contents might be of interest to you. Last Tuesday I was sitting in a tent conversing with one of my friends when suddenly I felt something on the back of my neck and reaching back was horrified to find that in my fingers I had gathered a vicious looking black spider, and a sudden twinge in my neck made me realize that I had been bitten. The first thing I did, however, was to strike a match and put my foot on him. I immediately went to the squadron physician and stated the facts to him, whereupon it seems that he lanced the spot several times and gathered therefrom a quantity of the venom that this thing had injected. I went to my Captain and told him also, and was given a slug of liquor with the advice that I retire, which I did. I had not been in my cot more than fifteen minutes before the poison started working, and I will say right here, that for the following seventy-two hours I was in mortal agony. It affected every portion of my anatomy in a different way; the back of my head became absolutely numb; at the base of my spine it felt as though two healthy labors had been inserted and some one with a strong breath was inflating both at the same time and that my back would burst. It was then that two physicians were called and they worked on me for two solid hours; morphine twice was given me internally and hypodermics four times (which I understand now was nothing more than distilled water), but nothing seemed to ease the pain. When daylight came I had not closed my eyes, but lay groaning in the field hospital all night; my stomach became hard as steel and distorted, my feet swelled three times normal size and felt as though hot irons were being applied, my eyes swelled and felt as though they would burst. I lost absolute use of both tracts, and could neither stool nor urinate, had the greatest desire to double up into a bow knot, and for seventy-two hours in the base hospital I lay in a cold perspiration. After four days in the hospital I was released as being well. Am at my home in the country now, but am far from being recovered. I have not regained the full use of my lower limbs. Everyone to whom I relate this story seems to doubt the seriousness of the case, and if this has been of interest to you and will assist you in your studies I am sure a line from you to corroborate my story will be appreciated. I am,

Yours very truly,
(Signed) Corporal JAMES HUTCHEON,
Troop B, 1st Squadron, 1st Cavalry,
Va. National Guard.
Camp Henry C. Stuart, Richmond, Va.

# ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., DECEMBER, 1916.

### The Convocation Week Meetings.

In this number of the NEWS we are publishing fairly full announcements of the annual meetings of various societies to be held in Convocation Week in New York City. These include not only entomological societies, but also those of wider scope in which many entomologists have an interest either direct, as members, or indirect by reason of related subject matter. It will be noted that the secretaries of these societies are looking forward to large attendances at their respective meetings. The population and the location of the largest city in the New World naturally arouses such expectations. It has therefore seemed to us desirable to give as full information as is available at the time this number goes to press in order that those of our readers likely to visit the metropolis in the Christmas season may be able to plan their days so as to be present at those meetings and gatherings of greatest personal interest to themselves. This will not always be easy, for it will be noted that the headquarters of the entomologists and of the zoologists are distant, nearly forty blocks from each other. It will be, no doubt, often necessary to make a choice between two, or even more than two, attractive programs. We also emphasize the advice of the secretaries to make early reservations in the hotels. In any event this great annual scientific congress is likely to be a great success and to repay attendance at its sessions.

## Questions and Answers.

The NEWS invites those having any entomological questions which they wish answered to send such in for publication under this heading, and also invites answers from its readers or others to these questions. Questions and replies should be as brief as possible and the Editors reserve the right not to publish any of either class which seem to them objectionable or inappropriate. Those sending in contributions to this department will please indicate whether they wish their names or merely one or more initials to appear in connection with their communications, but all such must be accompanied by the full name and address of the writer for the information of the editors.

ANSWERS TO QUESTION No. 2 (November, 1916, News, p. 426).—In reply to H.'s query in the November number of Entomological News I would suggest he try the method used at the U. S. Entomological Station at Lafayette, Indiana, for wintering coleopterous grubs, cut-

worms and various dipterous and hymenopterous parasites in the larval and pupal stages and described by the writer in the February, 1915, number of the *Journal of Economic Entomology*, page 135.

For convenience we have galvanized iron trays about ¾ inch deep, made to hold 60 or 70 ounce tin salve boxes, and these trays are fitted in grooves, like the drawers of an insect cabinet, during the summer. As winter approaches, all of the tin boxes are carefully examined, all grain and vegetation removed and soil used which should be sterilized and properly moistened. The soil should be of about the same moisture content as is the earth beneath a good sod, or say soil 2 or 3 inches below the surface. For inactive forms, such as cocoons, a cell is made in the soil. After this is done and a few nail holes made in the large tin trays to prevent any possible accumulation of water, a cavity is made in one side of a compost heap or pile of earth previously prepared. A layer of straw is placed in the bottom of the cavity and the trays of tin boxes piled one on the other. After they have all been stacked, a sheet iron covering is placed over the top, the pile of trays surrounded with a layer of straw and the whole covered with soil to a depth of 12 to 18 inches, depending on the intensity of the winter in any particular locality. At Lafayette this is usually done early in November and the boxes are removed by the middle of April. —JOHN J. DAVIS, Entomological Assistant, U. S. Entom. Lab'y, W. Lafayette, Ind.

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REGARDING question 2: I took a tin box about two feet long, solid on bottom and a few inches up the sides; but with wire sides above and wire top. A few tiny holes in the bottom carried off surplus water. I put in a layer of three inches of growing sphagnum moss, wetting it thoroughly, keeping all winter in a cold but not freezing place, and putting box in the sunlight only when hatching time was about to begin. During the final month I would wet the sphagnum perhaps twice. I laid the pupae in paper cornucopias pinned around the sides of the box, never on the wet moss. I never lost a specimen by mould. I do not believe that anyone had a better percentage of successful hatchings.

I never put cocoons in this box, only chrysalids and naked pupae, but those of every species obtainable.

I have had the best results with larvae by not allowing any earth into which to crawl. Dry sphagnum works better. *Citheronia regalis* is very apt to die if going underground to pupate in confinement. The Sphingidae also pupate better above ground, on the bare bottom of a box, hidden only by sphagnum.—R. P. D.

# Notes and News.

## ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

### A Swarm of the Monarch Butterfly in Iowa (Lep.).

On September 21, 1916, according to my informant, Mrs. S. K. Slemmons, a large swarm of Monarch butterflies, estimated to contain several thousand individuals, was seen by herself and family on their farm six miles southeast of Iowa City. The afternoon of that day was warm and rather misty, with a strong wind blowing from the northeast. The swarm came with the wind, from the northeast, about three o'clock, and alighted in a maple grove near the house, resting in great numbers on the twigs during the night and remaining until the next day. The butterflies were seen fluttering about in the maples during the morning and earlier hours of the afternoon, when they left, apparently not upon a single impulse but more or less in a straggling fashion. Mrs. Slemmons tells me that a friend of hers, living at West Branch, about ten miles to the northeast, reported seeing a large swarm near that village either on September 21 or the day before. Swarms of the Monarch used to be seen fairly often in the vicinity of Iowa City. As a boy I used to notice great assemblages of them in a little patch of woods near the public school which I attended. They would gather in thousands in the oak trees, arranging themselves in rows on the twigs, and their coming was the signal for a sort of hunt among the children who enjoyed the excitement of killing any butterflies venturing within reach. In later years I saw a smaller swarm in a little maple grove southeast of the town, but recently have not met with the phenomenon at all.—H. F. WICKHAM, Iowa City, Iowa.

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### Misapplied Effort (Odonata).

I was greatly interested and somewhat surprised to see a female *Anax junius* performing this morning on one of the crowded thoroughfares of Chicago. A sprinkling cart having recently passed, there was a diminutive puddle just outside the curbstone, the water not being to exceed an inch in depth, and therein was Mrs. Anax dipping the tip of her abdomen persistently and methodically as if the shallow receptacle were sufficient for the habitation and sustenance of an expected progeny. The brisk wind that was blowing and the crowd of pedestrians crossing the street interfered somewhat seriously with her efforts, but she nevertheless returned repeatedly to her task. I wonder if the unusually low temperature induced her to attend to her maternal duties, that up to this time she had carelessly if not wilfully, neglected.—O. S. WESTCOTT, Oak Park, Illinois, October 18, 1916.

[Where in this puddle were the plants in which *Anax* oviposits? Did this female really discharge eggs?—P. P. C.]

**Notes on South Carolina Ants (Hym., Hem.).**

The latest additions* to the known species of South Carolina ants are as follows:

*Formica truncicola*, var. *integra*, *Tetramorium caespitum*,
*Pheidole tysoni*, *Monomorium minimum*.

The sexual or winged forms of the following species of ants were seen during the months of April and May.

April: *Prenolepis imparis*, male and female;
*Camponotus americanus*, male and female;
*Dorymyrmex pyramicus*, male and female;
*Prenolepis parvula*, female.

May: *Iridomyrmex pruinosus*, var. *analis*, male and female.

*Lasius niger*, var. *americana* was found in attendance upon the following aphid: *Chaitophorus negundinus* on box elder.

*Cremastogaster lineolata* was found in attendance upon the following aphids, scales and treehoppers: *Platycotis 4-vittata* and *Platycotis sagittata* on oak; *Eulecanium nigrofasciatum* and *Toumyella liriodendri* on poplar; *Schizoneura lanigera* on apple; *Aphis setariae* on wild plum; *Lachnus parvus* on pine; *Eulecanium tulipiferae* on poplar. These ants were found in a large oak gall, *Andricus cornigerus*.

*Prenolepis imparis* was found attending the following aphids, scales and treehoppers: *Aphis setariae* on wild plum; *Lachnus australis* on pine shoots; *Platycotis 4-vittata* and *Platycotis sagittata* on oak; *Chaitophorus negundinus* on box elder; *Myzus cerasi* on cherry; *Lachnus parvus* on pine.

*Dorymyrmex pyramicus* was observed attending the following aphid: *Aphis setariae* on wild plum.

*D. pyramicus*, var. *flavus* was found in attendance upon *Lachnus australis*.

*Iridomyrmex pruinosus* and *Dolichoderus mariae* were also found attending this aphid.

*Formica pallide fulva* was found in attendance upon *Lachnus australis* and *Aphis setariae*.

April 15, 1916, the writer noticed *Trachymyrmex septentrionalis* out for the first time since last fall. Each colony was busy constructing a nest. The peculiarity in the structure of their nests was very noticeable. Every nest had small odd-shaped pellets thrown out 3 to 5 inches in front of the nest in the shape of a crescent. Ants were noted carrying apple blossom petals into the nest evidently for the purpose of forming the fungus on which they are known to feed.

The identifications of the ants were made through the courtesy of Dr. W. M. Wheeler. Mr. H. F. Wilson kindly identified two species of aphids.—M. R. Smith, Entomological Laboratory, Clemson Agricultural College, South Carolina.

* See Ent. News, xxvii, pp. 279-280, June, 1916.

**Insects of the Coronado Islands, Lower California.**

I am greatly indebted to the entomologists at the U. S. National Museum for critically examining a number of insects collected by my wife and myself on the South Island of the Coronado group, August 21, 1915. They are all additions to the fauna of the islands, but, with one exception, are species previously known to be common on the adjacent Californian mainland. The exception is the Hemipteron *Trapezus*, which is not listed at all by Van Duzee in his recent catalog and is also absent from Uhler's list of the Hemiptera of lower California (Proc. Calif. Acad. Sci., IV).

**Hemiptera** (det. Heidemann). *Corizus hyalinus* Fabr.; *Trapezus trimaculatus* Distant.

**Orthoptera** (det. Caudell). *Melanoplus cyanipes* Scudd.

**Hymenoptera** (det. Rohwer). *Palmodes laeviventris* Cress.

**Coleoptera** (det. Schwarz). *Carpophilus pallipennis* Say (very abundant), *Ipochus fasciatus* Lec., *Microrhopala rubrolineata* Mannh., *Coniontis subpubescens* Lec., *Eulabis rufipes* Esch. Of these species only the first and the third are in Horn's list of the Coleoptera of Baja California (Proc. Calif. Ac. Sci., IV).

The Coronado Islands appear to represent the tops of a submerged mountain range, and are presumably of recent date, geologically speaking. An exhaustive study of their insect fauna would yield results of great interest. The indications are that most of the species (at least) are identical with those of the adjacent mainland, and in a number of cases it is not at all probable that they reached the islands by crossing the water or through human agency. It therefore follows that we have some indication of the antiquity of existing species, and if endemic forms exist it will be interesting to inquire why they have undergone change while the surrounding species have remained unmodified. Such endemic forms may, however, be of two very different types: those actually evolved on the islands, and very close to mainland species, and those which have survived on the islands, having become extinct on the adjacent mainland. The latter, if found, may even represent peculiar genera. Specimens of the species considered identical with those of the mainland should be collected in numbers and carefully compared with Californian examples, with the hope of detecting small or average differences, indicating the beginning of differentiation. Should such differences be found, however, it will remain possible that it is the mainland form, not the island one, which has changed from the ancestral type.

It is especially important that such intensive studies should be begun at once, as many people now visit the islands, and no doubt every year the fauna and flora are modified by the addition of aggressive species following the footsteps of man.—T. D. A. Cockerell, Boulder, Colorado, September 2, 1916.

### A New Locality Record for Bombus terrestris moderatus Cr. (Hym.).

On July 3, 1915, I found a bumble-bee at Maligne Lake, near Jasper, Alberta, which I later identified as *Bombus terrestris moderatus* Cr. This identification was afterwards verified, November, 1915, by Prof. J. C. Bradley, of the Department of Entomology of Cornell University, and in December of the same year by Mr. Crawford, of the National Museum in Washington, D. C.

Franklin states that this species has only been found in Northern Alaska in North America, and that it probably occurs in Northern Yukon. The specimen I found is therefore far out of its known range. —E. L. DIVEN, Elmira, New York.

### The New Museum Building of the California Academy of Sciences.

The new museum building of the California Academy of Sciences in Golden Gate Park, San Francisco, was dedicated and formally opened on September 22, 1916. Organized in 1853, the Academy was located for a time at California and Dupont Streets, then on Market Street between Fourth and Fifth Streets, when its building was destroyed by the great fire following the earthquake of April, 1906. It will be recalled that this destroyed building contained many important entomological collections which were thereby lost, especially those gathered by the Academy's expeditions to the peninsula of Lower California and the adjacent Mexican mainland and described in the Academy's *Proceedings* of the nineties. We hope that the new building will be spared the fate of its predecessor.

## Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

**Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.**

**The numbers in Heavy-Faced Type refer to the journals, as numbered in the following list, in which the papers are published.**

**All continued papers, with few exceptions, are recorded only at their first installments.**

**The records of papers containing new species are all grouped at the end of each Order of which they treat. Unless mentioned in the title, the number of the new species occurring north of Mexico are given at end of title, within brackets.**

**For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.**

**4**—The Canadian Entomologist. **6**—Journal, New York Entomological Society. **8**—The Entomologist's Monthly Magazine, London. **10**—Nature, London. **11**—Annals and Magazine of Natural History, London. **16**—Bulletin, Societe Nationale d'Acclimatation de France, Paris. **50**—Proceedings, U. S. National Museum. **51**—Novitates Zoologicae, Tring, Herts, England. **68**—Science, New York. **75**—Annual Report of the Entomological Society of On-

tario, Toronto. **86**—Annales, Societe Entomologique de France, Paris. **153**—Bulletin, American Museum of Natural History, New York. **163**—American Journal of Science, New Haven, Conn. **169**—"Redia," R. Stazione di entomologia Agraria in Firenze. **179**—Journal of Economic Entomology. **180**—Annals, Entomological Society of America. **189**—Journal of Entomology and Zoology, Claremont, Calif. **195**—Bulletin, Museum of Comparative Zoology, Cambridge. **198**—Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass. **221**—New Hampshire Agricultural Experiment Station, Durham, N. H. **240**—Maine Agricultural Experiment Station, Orono. **272**—Memorias, Real Academia de Ciencias y Artes de Barcelona. **304**—Annals of the Carnegie Museum. **312**—American Journal of Pharmacy. **411**—Bulletin, The Brooklyn Entomological Society. **420**—Insecutor Inscitiae Menstruus: A monthly journal of entomology, Washington. **447**—Journal of Agricultural Research, Washington. **477**—The American Journal of Tropical Diseases and Preventive Medicine, New Orleans. **491**—Transactions, American Microscopical Society, Decatur, Illinois. **507**—Occasional Papers, Museum of Zoology, University of Michigan. **538**—Lorquinia, Los Angeles. **539**—University of Illinois Agricultural Experiment Station, Urbana.

**GENERAL SUBJECT. Berlese, A.**—Sul polimorfismo degli insetti, **169,** xi, 211-38. **Cockerell, T. D. A.**—Some American fossil insects, **50,** li, 89-106. **Cosens, A.**—The founding of the science of Cecidology, **75,** 1916, 88-93. **Hegner, R. W.**—Some methods of preparing insects for demonstration purpose, **491,** xxxv, 185-6. **Rau & Rau**—The sleep of insects; an ecological study, **180,** ix, 227-74. **Tillyard, R. J.**—Elasticity and entomology, **10,** xcviii, 128-9. **Tothill, J. D.**—The ancestry of insects with particular reference to Chilopods and Trilobites, **163,** xlii, 373-87.

**PHYSIOLOGY AND EMBRYOLOGY. Smith, E. A.**—Spermatogenesis of the dragon-fly Sympetrum semicinctum with remarks upon Libellula basalis, **198,** xxxi, 269-302.

**MEDICAL. Zetek, J.**—Reducing malaria by reducing the number of Anopheles within buildings, **180,** ix, 275-83.

**ARACHNIDA, ETC. Banks, N.**—Report on Arachnida collected ....in British Columbia, **50,** li, 67-72. **Moles, M. L.**—Crab spiders of the Claremont-Laguna region, **189,** viii, 112-18.

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**Chamberlin, R. V.**—The lithobiid genera Oabius, Kiberbius, Paobius, Arebius, Nothembius, and Tigobius [many new], **195,** lvii, 115-201. **Dalmas, C.**—Revision du genre Orchestina [1 new], **86,** 1916, 203-258. **McGregor, E. A.**—The citrus mite named and described for the first time, **180,** ix, 284-89.

**NEUROPTERA, ETC.** **Ferris, G. F.**—Some generic groups in the mallophagan family Menoponidae, **4,** 1916, 301-11. **Hood, J. D.**—A new Plectothrips from Jamaica, **420,** iv, 78-80. **Kahl, H.**—A list of the Odonata collected on the Isle of Pines....in 1910, 1912-1913, now contained in the Carnegie Museum, **304,** x, 519-26. **Longinos-Navas, R. P.**—Notas sobre el orden de los Rafidopteros [2 new families], **272,** xii, 9 pp. **Walker, E. M.**—A curious trap for dragonflies, **4,** 1916, 314-15.

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**Cockerell, T. D. A.**—(See under General.)

**ORTHOPTERA.** **Allard, H. A.**—Some musical O. at Clarendon, Virginia, **4,** 1916, 356-8. **Bruner, L.**—South American crickets, Gryllotalpoidea and Achetoidea, **304,** x, 344-428. **Chopard, L.**—Etude des Mantides Americains de la collection I. Bolivar, **86,** 1916, 161-87. **Foucher, G.**—Etudes biologiques sur quelques O., **16,** 1916, 329-42 (cont.). **Holland & Kahl**—A list of the O. collected in the Isle of Pines....1910, 1912-13, **304,** x, 541-45.

**HEMIPTERA.** **Bergroth, E.**—New or little known heteropterous Hemiptera in the U. S. Nat. Mus., **50,** li, 215-239. **Kraemer, H.**—The nature and structure of cochineal, **312,** lxxxv, 344-63. **Maxson, A. C.**—Some unpublished notes on Pemphigus betae, **179,** ix, 500-5.

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**Davis, W. T.**—Two new Cicadas belonging to the genus Okanagana, **6,** xxiv, 233-6. **Knight, H. H.**—Remarks on Lygus invitus, with descriptions of a n. sp. and variety of Lygus, **4,** 1916, 345-9. **Olsen, C. E.**—A new pentatomid, **411,** xi, 82-3.

**LEPIDOPTERA.** **Dyar, H. G.**—Descriptions of new L. from Mexico, **50,** li, 1-37. **Engelhardt, G. P.**—The present status of the canker worms Alsophila pometaria and Paleacrita vernata in Brooklyn, **411,** xi, 85-6. **Essig, E. O.**—The genus Vanessa in California, **189,** viii, 97-111. **Grinnell, Jr., F.**—The study of variation, **538,** i, 17-18. **Malcolm, G. E.**—Butterfly collecting in Placerita Canyon, Calif., **538,** i, 21-22. **Prout, L. B.**—New neotropical Geometridae, **51,** xxiii, 151-190. **Rothschild, L.**—Some new Arctiadae, **51,** xxiii, 264-71. **Rothschild & Jordan**—Further corrections of and additions to our "Revision of the Sphingidae," **51,** xxiii, 247-63. **Swett, L. W.**—Geometrid notes [2 new]; On the genus Xanthorhoe [4 new], **4,** 1916, 326-8; 349-56.

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**Cockerell, T. D. A.**—(See under General.) **Hampson, G. F.**—Descriptions of n. sps. of the family Arctiadae in the British Museum [1 new], **51,** xxiii, 230-240.

**DIPTERA.** **Barret, H. P.**—The mosquitoes of Mecklenburg County, North Carolina, **477,** iii, 607-9. **Bezzi & Tavares**—Alguns

Muscideos cecidogenicos do Brazil, **223,** xiv, 155-170. **King, J. L.**—Observations on the life history of Pterodontia flavipes, **180,** ix, 309-21. **Lochhead, W.**—Some notes regarding nose and other bot flies, **75,** 1916, 102-8. **Metcalf, C. L.**—Syrphidae of Maine, **240,** Bul. 253, 193-264.

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**Alexander, C. P.**—New N. A. sps. of the genus Gonomyia [5 new], **4,** 1916, 316-25. **Cockerell, T. D. A.**—(See under General.) **Cockerell & Andrews**—Some D. (Microdon) from nests of ants [2 new], **50,** li, 53-6. **Felt, E. P.**—New western gall midges [1 n. g., 21 n. sps.], **6,** xxiv, 175-96. **Knab, F.**—Critical notes on Syrphidae [1 new sp.]; What is Tabanus mexicanus? **420,** iv, 91-95; 95-100. **Malloch, J. R.**—A new genus and species of No. Am. Chloropidae, **411,** xi, 86-7. **Parker, R. R.**—New sps. of New England Sarcophagidae [1 new], **4,** 1916, 359-64 (cont.). Sarcophagidae of New England: Genus Sarcophaga [1 new], **6,** xxiv, 171-5. **Townsend, C. H. T.**—New genera and sps. of muscoid flies [7 n. g.; 7 n. sps.], **50,** li, 299-323. Some new No. American muscoid forms [3 n. g., 1 n. sp.], **420,** iv, 73-8.

**COLEOPTERA. Champion, G. C.**—On new exotic Scraptiina, **8,** 1916, 233-240 (cont.). **Forbes, S. A.**—A general survey of the May beetles (Phyllophaga) of Illinois, **539,** Bul. No. 186. **Herrick & Matheson**—Observations on the life history of the cherry leaf beetle, **447,** v, 943-950. **Knaus, W.**—Notes on Strategus mormon; A Kansas variety of Euphoria herbacea, **411,** xi, 79-81; 84. **McDermott, F. A.**—Flashing of fireflies, **68,** xliv, 610.

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**Cockerell, T. D. A.**—(See under General.) **Dyar, H. G.**—New Aedes from the mountains of California [6 new], **420,** iv, 80-90. **Leng & Mutchler**—Descriptive catalogue of West Indian Cicindelinae [1 new], **153,** xxxv, 681-99. **Van Dyke, E. C.**—Supplementary notes and descriptions of N. Am. Ostomidae, Cleridae and Cossonus [4 new], **411,** xi, 71-9. **Wickham, H. F.**—The fossil Elateridae of Florissant [many new], **195,** lx, 493-527.

**HYMENOPTERA. Ackerman, A. J.**—The carpenter bees of the U. S. of the genus Xylocopa, **6,** xxiv, 196-32. **Cockerell, T. D. A.**—Some bees, British Guiana, **507,** No. 24, 3 pp. **Davis, H. V.**—Scarcity of wasps, **10,** xcviii, 109. **Gaige, F. M.**—The Formicidae of the Shiras expedition to Whitefish Point, Michigan, in 1914, **507,** No. 25, 4 pp. **Girault, A. A.**—A remarkable new g. of Encyrtidae from the West Indies, bearing two ring joints, **6,** xxiv, 232-3. **Fyles, Dr.**—Observations upon some of the predaceous and parasitic H., **75,** 1916, 52-60. **Maxwell, H., et al.**—Scarcity of wasps, **10,** xcix, 148-9. **Sladen, F. W. L.**—Canadian species of the bee genus Stelis [1 n. subg., 1 n. sp.], **4,** 1916, 312-14. **Turner, R. E.**—Notes on fos-

sorial H.—XXIV. On the genus Nitela, **11,** xviii, 343-46. **Urbahns, T. D.**—Life history of Habrocytus medicaginis, a recently described parasite of the Chalcis fly in alfalfa seed, **447,** vii, 147-54.

**Cockerell, T. D. A.**—Bees from the northern peninsula of Michigan [1 new], **507,** No. 23, 10 pp. (See under General.) **Crawford, J. C.**—Nine n. sps. of H. [8 new], **420,** iv, 101-7. **Girault, A. A.**—The occurrence of the genus Achrysocharelloidea in No. Am.; Descriptions and observations on some chalcidoid H. [8 new], **4,** 1916, 336; 337-44. Descriptions of miscellaneous No. Am. Chalcidoid H. of the family Eulophidae [3 n. gen.; 23 n. sps.]; New N. Am. H. of the family Eulophilidae [2 n. gen.; 11 n. sps.], **50,** li, 39-52; 125-33. New miscellaneous chalcidoid H. with notes on described species [2 n. gen.; 12 n. sps.], **180,** ix, 291-308. Three new chalcid flies from California, **189,** viii, 119-22. A new miscogasterid chalcid fly from Maryland; Pirene marylandensis n. sp., **411,** xi, 87-8; 88. **Sladen, F. W. L.**—(See above).

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CHECK LIST OF THE HEMIPTERA (EXCEPTING THE APHIDIDAE, ALEURODIDAE AND COCCIDAE) OF AMERICA, NORTH OF MEXICO, by EDWARD P. VAN DUZEE. New York Entomological Society. Price, $1.50.

In this work just published, Mr. E. P. Van Duzee puts all American hemipterists under a heavy burden of gratitude. He brings together and presents in orderly fashion the data which have accumulated in the last thirty years in this branch of entomology. None can adequately realize the debt we owe Mr. Van Duzee better than those who have themselves attempted the enormous labor of correlation of the scattered fragments that constitute entomological literature.

In this new Check List, Mr. Van Duzee has given American hemipterists an adequate point of departure for classifying and arranging their collections. Nothing similar and covering the whole ground in Hemiptera has been attempted since Uhler's Check List appeared thirty years ago. State and local lists have been published; a Catalogue saw the light of day, but Uhler, up to this time, has remained the sole comprehensive and orderly arrangement of the North American Heteroptera. Van Duzee has gone beyond his predecessors and has considered the Homoptera as well, except as indicated.

Did Science stand still, it would either perish of stagnation, or on the instant begin a retrograde motion. Hence it is that this work is obsolescent from the moment the last entry was made just before it went into the printer's hands. Current specialists' monographs modify certain of the data.

The principles guiding Mr. Van Duzee in his work are set forth in the Preface, and this Check List must be used and judged in their light. In nomenclature there is much room for dissent, and especially

so in the debated question of priority. A characteristic of the author is ingrained conservatism, whence many a name newly proposed is rejected in favor of another hallowed by time or usage. Another highly debatable point is his rejection of genera for which no type species can be fixed under the International Rules. The trouble is the type fetich is an entirely modern invention and the primitive authors did not work under it at all. We are endeavoring to submit their work to retroactive laws which in the end will lead to endless confusion. A policy of "thorough" in this would allow many a budding genius to go down to posterity as the author of untold genera. But this vast and wordy topic is best left here.

The one fault, if fault it be, of this Check List, is the manner of indicating distribution, which is to my mind too rough. Where there are few States, or where the habitat is in a definite limited region, it should be so stated. Instead of "Can.," "E.," etc., it would have been better, because more definite, to indicate distribution by the familiar geographical terms "Eastern States," "Atlantic States," etc., or, preferably, by the recognized zoogeographical regions.

A comparison with Oshanin's Catalogue of Palaearctic Hemiptera may not be out of place. For the entire Palaearctic Region, this work lists 1005 genera and 5476 species, 741 and 3564 respectively being Heteroptera and 264 and 1912 Homoptera. In our more restricted area, Van Duzee enumerates 698 genera and 2945 species, the Heteroptera being 465 and 1469 respectively and the Homoptera 233 and 1476. It might seem that much still remains to be discovered with us. Of the 3564 species of Heteroptera of the Palaearctic Fauna, 1078, a little over 30% are Miridae; Van Duzee lists only 398 out of 1469 species, or about 27% of the total. On this basis, some 60 species of Miridae alone still await discovery. Yet, compared with Uhler's old List, what an advance has been made! Uhler listed for the whole of North America only 1448 species. Thirty years later the number is greater North of Mexico alone! Banks lists only 1268 species of Heteroptera for the same region in 1910. By these figures we may appreciate the growth of Hemipterology in America, yet see how far we still have to go to make as adequate a survey of our own fauna as there is of the Old World forms.

But whatever is open to question from any angle, Van Duzee's work definitely fixes his position as the present day leader of American hemipterology and as a worthy successor to the father of the science in this country, Professor P. R. Uhler.

The New York Entomological Society merits the thanks of all working entomologists for bringing out this important piece of work, and it is to be congratulated on its enterprise and public spirit.—J. R. DE LA TORRE BUENO.

# Doings of Societies.

## Annual Meeting of the Entomological Society of America.

The Annual Meeting of the Society will be held in New York City on Tuesday and Wednesday, December 26 and 27, 1916. On the first day an afternoon session only will be held; on the second there will be forenoon and afternoon sessions, and in the evening the Annual Address will be given by Prof. T. D. A. Cockerell, on the subject, "Fossil Insects."

Headquarters will be at the Hotel Endicott, Columbus Ave. and 81st St., near the American Museum of Natural History. Rates for room begin at one dollar (with bath $1.50), so it is hoped that every entomologist can find accommodations suited to his purse, and all can be together. Make reservations early, and plan to be at the first session.

The American Association of Economic Entomologists have chosen the same headquarters, and their sessions begin Thursday morning, occupying the rest of the week.

Members wishing to present papers will please fill out and return blanks [which have been sent to each member] as early as November 20. The program was not as full as it should have been last year; let us increase it this time.

Exhibits of interesting specimens, apparatus, etc., are very much desired. Members are requested to inform the Secretary in advance if they wish any special sort of installation. Last year several unusually good things were shown. This department should not be overlooked.

The indications are that the Association for the Advancement of Science, in affiliation with which we meet, will have a record-breaking attendance, and this will probably also be the case with the entomological meetings.

A communication is enclosed from the Thomas Say Foundation.

J. M. ALDRICH, *Secretary-Treasurer.*

West La Fayette, Ind., Nov. 1, 1916.

### THOMAS SAY FOUNDATION.

The Thomas Say Foundation, a permanent publishing committee of the Entomological Society of America, charged with the function of publishing a series of memoirs on North American Entomology, announces that its first volume is in press, and will appear in December; it is by J. M. Aldrich, on "Sarcophaga and Allies in North America," and will make a volume of about 325 pages octavo, with 170 figures on 16 plates. It deals with a neglected group of common flies, some of which are important parasites, especially of grasshoppers, while others are scavengers and excrement feeders; one species has been definitely connected with human intestinal myiasis. Thus in several ways the group is of economic importance. Dr. Aldrich describes 145 species

and varieties, of which about 100 are new; he gives extensive analytical tables and figures the genitalia of the male for 138 species, greatly simplifying identification.

The volume will be bound in cloth, and the selling price is fixed at three dollars, postpaid to advance subscribers.

A new publishing medium capable of handling large works on North American entomology is a great desideratum. As is well known, several valuable manuscripts that have cost years of labor are at the present time awaiting a publisher. There is little inducement for entomologists to undertake the larger projects under these conditions, yet these larger projects are precisely the ones most needed. The only remedy in sight is in the coöperation of the entomological fraternity with the Say Foundation. The first volume of the Foundation is of modest size, but the successful sale of this will pave the way for something larger next year.

Beginning with no pecuniary resources except a grant of fifty dollars from the parent Society for preliminary expenses, the Foundation solicited ten-dollar advance subscriptions to its publications last year, which brought in seventeen contributions. Having now incurred obligations for which it is assuming responsibility (pending reimbursement from sales of its publication), the Foundation renews its appeal for support, and requests members to detach one of the blanks [which have been sent to each member] and forward with check for corresponding amount to the Treasurer. All who feel able to do so are solicited to make the ten-dollar subscription.

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### Twenty-ninth Annual Meeting of the American Association of Economic Entomologists.

The 29th annual meeting of the American Association of Economic Entomologists will be held in New York City, December 28th to December 30, 1916, under the presidency of Dr. C. Gordon Hewitt. The session will open on Thursday, December 28th, at 10 a. m., and will be continued during the afternoon of that day. At 8 p. m., the meeting of the Section on Apiary Inspection will be held. On Friday, December 29th, 10 a. m., the session of the general association will be held. The afternoon and evening of that day will be devoted to meetings of the section on Horticultural Inspection. On Saturday, December 30th, the final session of the Association will be held and the meeting will be adjourned at noon on that date unless a lengthy program necessitates holding an afternoon session.

The Entomological Society of America holds its meetings on Tuesday and Wednesday, December 26th and 27th, and the public address before that society will be given on Wednesday evening.

Hotel headquarters will be at the Endicott, Columbus Ave. and 81st St., where special rates of $1.50 per day have been secured. All mem-

bers are urged to make early hotel reservations in order that there may be no difficulty in securing satisfactory accommodations.

The meeting at New York promises to be well attended. Attention is called to a resolution passed by the Association several years ago providing that papers by non-members cannot be admitted to the program.

Blank applications for membership may be secured from the Secretary or from Prof. W. C. O'Kane, chairman of the membership committee, Durham, N. H. It will greatly facilitate the work of that Committee if applications are made as soon as possible, so that a large part of its work may be done before the time of the meeting.—A. F. BURGESS, *Secretary*, Melrose Highlands, Mass.

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**Fourteenth Annual Meeting, American Society of Zoologists.**

The American Society of Zoologists, in conjunction with Section F of the American Association for the Advancement of Science and the American Society of Naturalists, will hold its fourteenth annual meeting, under the auspices of Columbia University, probably in the lecture room in Schermerhorn Hall, on Wednesday, Thursday and Friday, December 27-29, 1916.

Four half day sessions will be devoted to the reading of papers, one to the business of the Society and one, in accordance with by-law 4b, will be given to a meeting with the Naturalists.

Members are invited to send titles of papers for the program but a title will not be placed on the program unless it is accompanied by an abstract and reaches the Secretary by December 1.

Papers on Genetics will be scheduled for the session to be held on Thursday afternoon as directed by the Society at the Columbus meeting, otherwise the program will be arranged in accordance with by-law 5 and members are requested to indicate the general subject under which each paper should be listed.

In view of the prospect that the program for this meeting will be long, the Secretary is directed by the Executive Committee to suggest to members that they restrict themselves to one paper, and to announce that, if found to be necessary, those papers considered by the Executive Committee to be of least general interest will be read by title. Not more than fifteen minutes will be allowed for the presentation of any paper.

Abstracts of papers should be typewritten and put in the exact form desired in print. They should be limited to four pages and contain no illustrations. All abstracts will be printed by the Wistar Institute and mailed with the program to members of the Society about December 9. Reprints of abstracts, in case they are desired, may be secured by arrangement with the Director of the Wistar Institute. The printed

abstracts may be used as page proof and returned corrected for the January number of the *Anatomical Record.*

The Zoological Laboratory at Columbia University has been secured for exhibits and demonstrations and members are especially urged to contribute to this important part of the program. Titles of exhibits should be sent in not later than December 1 to be listed on the program.

Headquarters of the Society will be the Hotel Astor, 43rd Street and Broadway. Single rooms, without bath, for one person, $2.50; for two persons, $3.50. Single rooms, with bath, for one person, $3.50; for two persons, $4.50.

Rooms in the dormitories of Columbia University and Barnard College may be had at a cost of $1 per day by applying to Professor H. E. Crampton, Chairman, Columbia University Committee, American Museum of Natural History, New York City.—CASWELL GRAVE, Secretary, Johns Hopkins University, Baltimore, Maryland.

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**Thirty-fourth Annual Meeting, American Society of Naturalists.**

The American Society of Naturalists, in affiliation with the American Association of Anatomists, the American Society of Zoologists, and the Botanical Society of America, will hold its thirty-fourth annual meeting at New York, under the auspices of Columbia University, on Friday, December 29, 1916, and, by invitation of the Carnegie Station for Experimental Evolution, at Cold Spring Harbor on Saturday, December 30th.

The Botanical Society of America will place the genetical papers of its program on Thursday morning, December 28th, and the American Society of Zoologists will group its genetical papers in a program for Thursday afternoon. By this arrangement there will be sessions of genetical interest on the day preceding the meetings of the Naturalists and continuing with the Naturalists' programs for Friday and Saturday.

The Friday morning session of the Naturalists will be open for papers on evolution, genetics and related subjects from members or invited guests, titles of which with estimated length of delivery must be in the hands of the Secretary by December 1st. Requests for microscopes or for space for demonstrations should also be sent to the Secretary.

The program of Friday afternoon will be a symposium on *Biology and National Existence,* with papers by Stewart Paton, W. J. Spillman, V. L. Kellogg, Jacques Loeb and E. G. Conklin.

The Naturalists' dinner, in which members of the affiliated societies are invited to participate, will be held in the evening of Friday. Hotel Manhattan. Price, $3.00.

There will be a joint smoker for members of the Naturalists and of the affiliated societies at Columbia University Commons, Wednesday evening, December 27th.

Members of the American Society of Naturalists are invited by the Carnegie Station for Experimental Evolution to spend Saturday, December 30th, at Cold Spring Harbor. A morning session from 10.30 to 1 will be held in Blackford Hall for the presentation of genetical papers. After a lunch there will be opportunity to inspect the equipment of the Station, the activities of which will be explained by the staff. Arrangements for trains will be announced in the final program.

Headquarters of the Naturalists will be at the Hotel Manhattan, Forty-second Street. Members are advised to make early reservations. Single rooms, $2.50; with bath, $3.50. Double rooms, $4.00 up; with bath, $5.00 up.—BRADLEY M. DAVIS, *Secretary*. University of Pennsylvania, Philadelphia.

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**The Ecological Society of America, Announcement.**

NEW YORK MEETING.—A meeting of the Society will be held in New York on December 27 to 29, 1916, sessions being arranged as follows:

*Wednesday, December 27.* 9 a. m., business meeting; 10 a. m., Session for the reading of papers of general ecological interest.

*Thursday, December 28.* 10 a. m., Session for the reading of papers of zoological interest. 2 p. m., Session for the reading of papers of interest to foresters, agriculturists and climatologists.

*Friday, December 29.* 10 a. m., Joint session with the Botanical Society of America for the reading of papers of botanical interest. 2 p. m., Invited papers.

Further details regarding the meeting will be announced soon.

CLIMATOLOGICAL COMMITTEE.—The President of the Society has appointed a permanent committee on climatological conditions and the measurement of physical factors. It will be the function of this committee to stimulate the investigation of environmental conditions and the securing of climatological data which are of ecological significance. It will supervise all of the cooperative investigations undertaken by the Society in these fields.

The members of the committee are B. E. Livingston, Chairman; Lyman J. Briggs, A. E. Cameron, D. T. MacDougal, W. Dwight Pierce, E. C. Schneider, Forrest Shreve and Raphael Zon. Other members will be added as the work of the committee develops. At the invitation of the Weather Bureau the members of this committee will confer with a representative of the Bureau regarding desirable extensions in the scope of the data now secured by them.

FORREST SHREVE, *Secretary-Treasurer.*

TUCSON, ARIZONA, *November 3*, 1916.

# ENTOMOLOGICAL NEWS

AND

PROCEEDINGS

OF THE

ENTOMOLOGICAL SECTION

OF THE

ACADEMY OF NATURAL SCIENCES

OF

PHILADELPHIA.

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VOLUME XXVII, 1916.

PHILIP P. CALVERT, Ph.D., Editor.
E. T. CRESSON, Jr., Associate Editor.

HENRY SKINNER, M. D., Sc. D., Editor Emeritus.

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☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued

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# EXCHANGES.

**This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.**

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued

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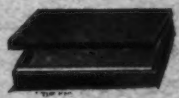

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